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VERIFICATION STUDY ASSESSMENT OF POTENTIAL GROUNDWATER POLLUTION NAS WHITING FIELD FL

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GERAGHTY AND MILLER

Verification Study

Assessment of Potential Ground-Water Pollution at Naval Air Station Whiting Field, Florida

Prepared for

NAVAL FACILITIES ENGINEERING COMMAND
Southern Division
Charleston, South Carolina

DECEMBER 1986

GERAGHTY & MILLER, INC.
Ground-Water Consultants

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PROJECT NO. T290WH2

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INTRODUCTION

In April 1986, Geraghty & Miller, Inc., (G&M) was retained by the Naval Facilities Engineering Command, Southern Division (Navy) to provide hydrogeologic consulting services at the Whiting Field Naval Air Station (NAS) near Milton, Florida (see Figure 1). Specifically, G&M was to assist the Navy in performing Phase II (Confirmation Study) of the Navy Assessment and Control of Installation Pollutants (NACIP) program. This program is designed to identify contamination of Navy lands resulting from past waste-management activities and to institute corrective measures as needed.

The NACIP program consists of three phases. The first phase is the Initial Assessment Study (IAS) which utilizes record searches and personnel interviews to collect and evaluate all evidence supporting the existence of a contamination problem at an installation. This phase was completed in May 1985 and resulted in the preparation of a report entitled Initial Assessment Study of Naval Air Station Whiting Field, Milton, Florida.

The second phase, the Confirmation Study, involves on-site investigations to confirm or refute the existence of contamination and to quantify the extent of the problem if contamination is present and to evaluate the necessity of conducting mitigating actions or clean-up operations.

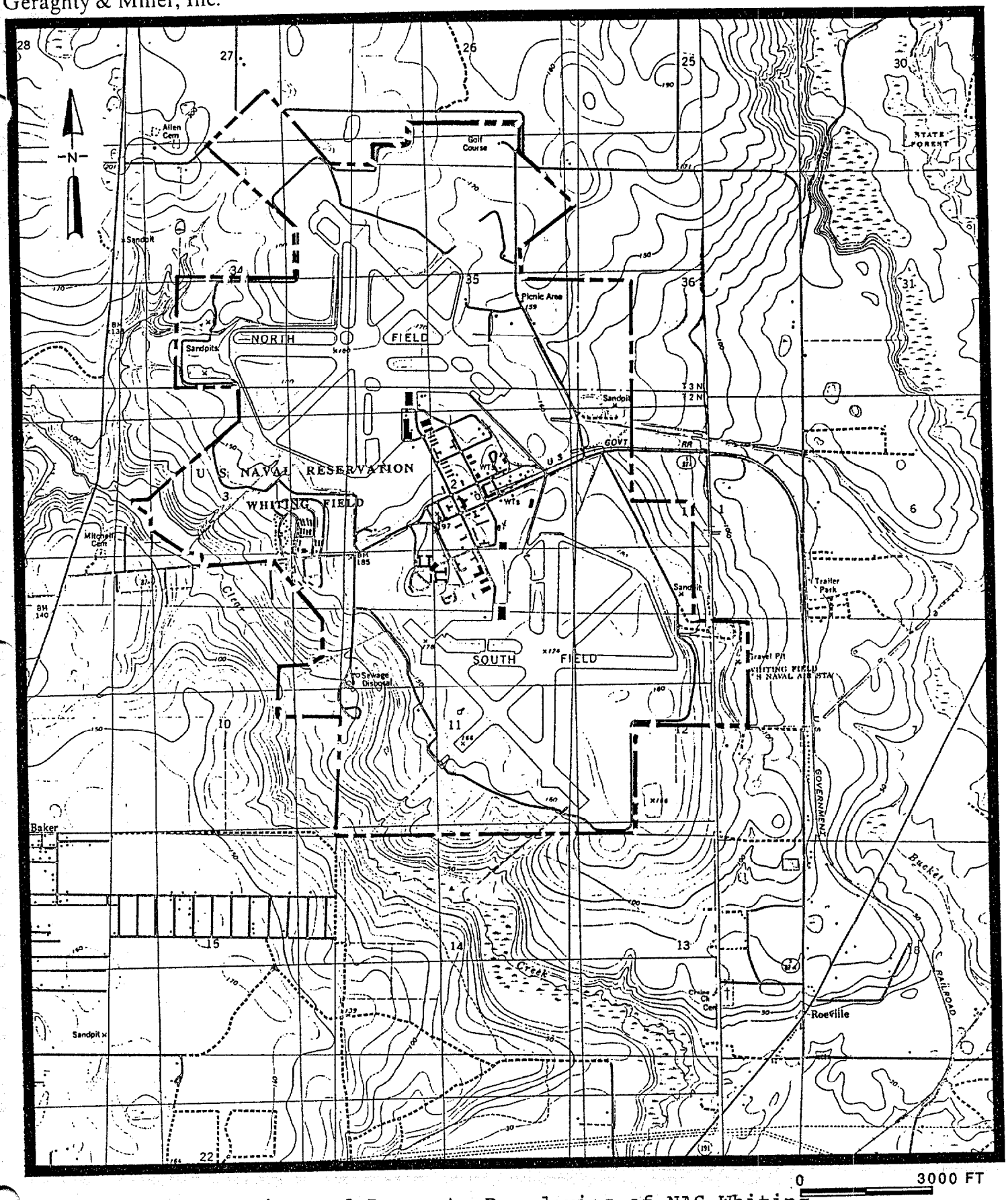


FIGURE 1. Location and Property Boundaries of NAS Whiting Field, Florida.

The third and final phase is the implementation of corrective actions and remedial measures to control or mitigate the contamination.

The Confirmation Study consists of two parts, Verification and Characterization. During Verification, the presence or absence of potential contaminants in ground water at each of the sites recommended for study in the IAS is assessed. Based on these findings, further investigation is recommended for Characterization in order to determine the nature and extent of contamination at sites requiring additional study.

During the Verification Study, 17 sites were studied and their locations are shown in Figure 2; the site identification numbering system used in the IAS report has been retained and extended to this study. This report presents the work performed and results of the Verification Study and contains recommendations for further characterization at selected sites.

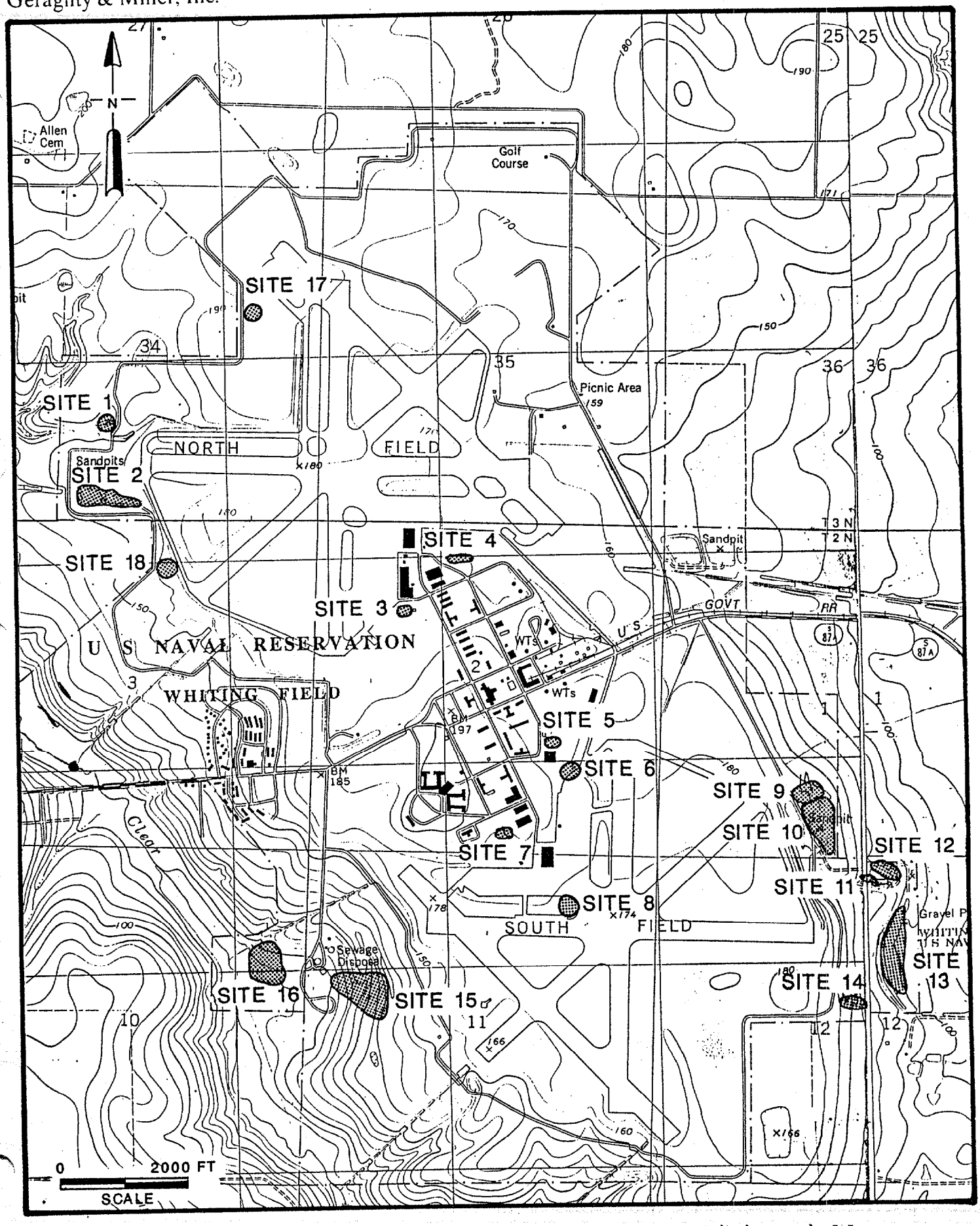


FIGURE 2. Locations of Sites Investigated at NAS Whiting Field.

APPROACH

The objective of the Verification Study is to determine whether release of hazardous pollutants into the soil, ground water, or surface water has occurred from past hazardous-waste disposal methods. In evaluating the sites during the Confirmation Study, the primary consideration is the risk to human health and the environment. The factors taken into account in preparing recommendations for further study at specific sites, as outlined in Florida Administrative Code 17-4.245(7)b, include: (1) size of the contaminant plume, (2) toxicity of the contaminants and their concentrations, (3) rate and direction of plume movement in relation to sources of water supply, (4) rate of attenuation of the plume, (5) current and projected future use of adjacent ground and surface waters affected by the plume, and (6) costs of further study or clean-up in comparison to the benefits to the public of such actions.

For sites where characterization studies are recommended, the proposed programs of monitor-well installation and sampling are designed to provide sufficient data for determining the need for long-term monitoring or corrective action and for the design of corrective measures, if necessary. For other sites, although low levels of contaminants may have been found, no further actions were recommended because of the limited benefits to the public in view of the costs for additional study or clean-up.

BACKGROUND

Since its commission in 1943, NAS Whiting Field has generated a variety of wastes related to pilot training, the operation and maintenance of aircraft along with ground support equipment, and the station's facility maintenance activities. Both liquid and solid wastes from these sources have been disposed of at various places on the base. Most of the operations and activities at the station are now provided by private contractors; therefore, very few people are available that can provide detailed information on disposal practices prior to the past five years.

The IAS identified 16 waste-disposal sites at NAS Whiting Field and, based on this study, 15 sites were recommended for further evaluation; Site 2 (Northwest Open Disposal Area) was judged to not warrant further consideration. In November 1985, G&M prepared for the Navy a Plan of Action entitled Naval Assessment and Control of Installation Pollutants, Verification Study, NAS Whiting Field, which was subsequently submitted to the Florida Department of Environmental Regulation (FDER). After discussions with the FDER during a meeting on December 17, 1985, some changes to the Plan of Action were made and two more sites (17 and 18) were added to the Confirmation Study. Both sites are active sites where waste oils and fuels are burned in firefighting-training exercises. One of the sites (Site 5 Battery Shop Seepage Pit) is presently being studied

under Consent Order with the FDER and data from the site are included in a separate report entitled Detection and Monitoring Program, Battery Shop Site, NAS Whiting Field, Florida, dated November 14, 1985. Baseline data collected from Site 5 have been used to assist in the overall understanding of the ground-water system at the base.

WORK PERFORMED

Work conducted during the course of this study began with the collection and assimilation of existing data and literature pertinent to the project which included the IAS. A Plan of Action was then prepared (December 1985), which contained details of the proposed scope of work for the Verification Study. In addition, a Quality Assurance Project Plan was prepared and submitted to the FDER for their review and approval. The field work was performed in May and June 1986 and included the items described below.

Monitor Wells

Sixteen monitor wells were installed at the locations described in the individual site assessments. All wells were installed and screened into the uppermost saturated part of the sand and gravel aquifer. The construction details of a typical monitor well are shown schematically in Figure 3 and construction details for each monitor well are presented in Table 1. All wells were drilled by the mud-rotary method and drill cutting samples were collected at 5-foot intervals and described by a geologist; lithologic logs of each well location are contained in Appendix A. The casing and screen consisted of Schedule 40 threaded PVC so that no PVC cement was used; four-inch-diameter casing and screen were necessary in order to install a submersible pump for development and sampling. All well screens were 10-feet long with 0.010-inch slots. A gravel pack of 20/30 grade silica sand was tremmied

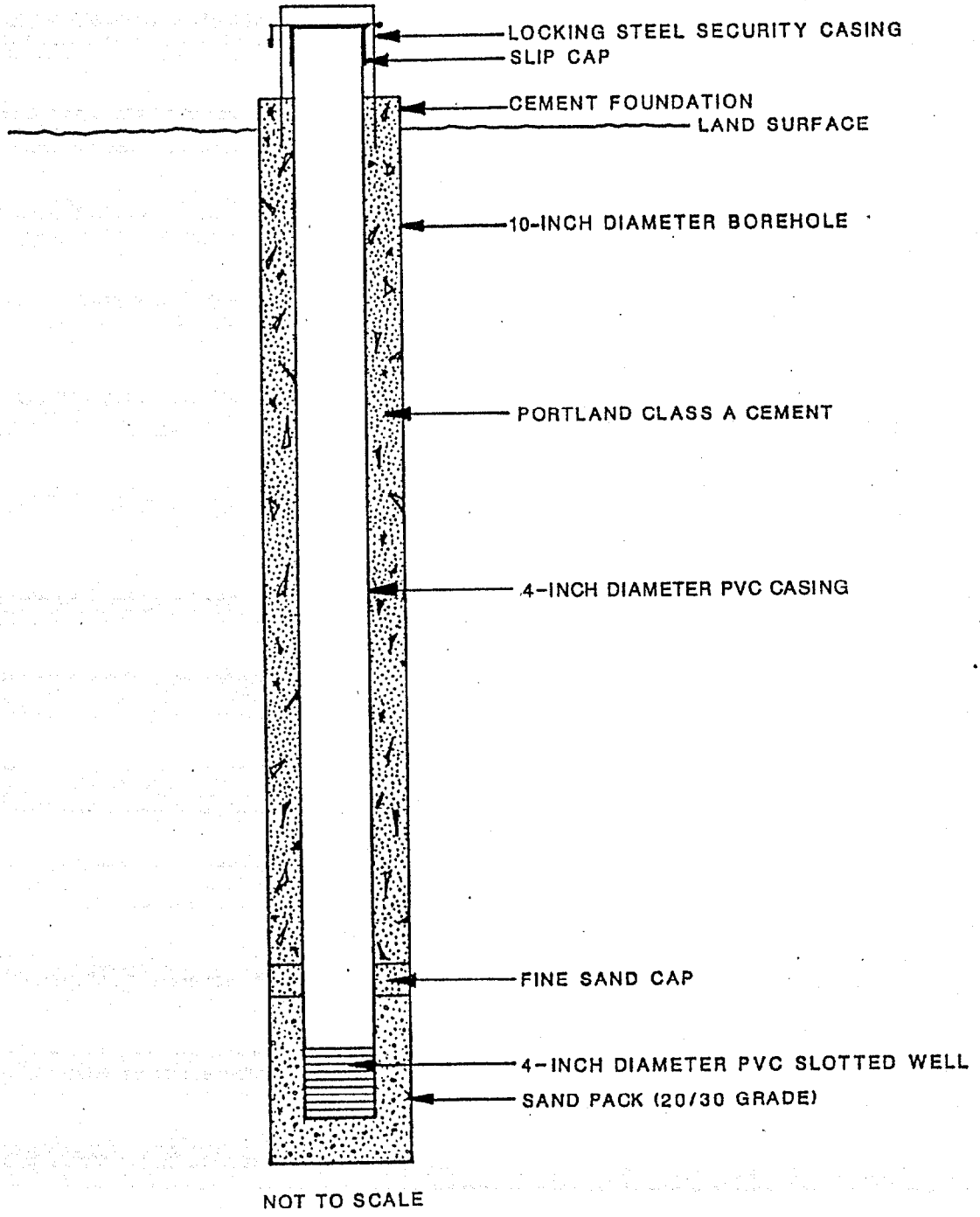


FIGURE 3. Schematic Diagram of Monitor Well Showing Typical Construction Details.

Table 1. Construction Details of Monitor Wells Installed by Geraghty & Miller, Inc., at NAS Whiting Field

SITE/ WELL NUMBER	LAND ELEVATION (ft msl)	TOP OF CASING (ft msl)	TOTAL WELL DEPTH (ft)	SCREEN INTERVAL (ft)	DEPTH TO GRAVEL PACK (ft)
1	140.55	142.60	122.5	112.5-122.5	104
3E	173.52	175.42	152.5	142.5-152.5	134
3W	173.51	174.90	152.5	142.5-152.5	134
4	170.62	172.49	152.5	142.5-152.5	134
7	185.02	187.77	142.5	132.5-142.5	124
8	172.36	172.92	180.0	170.0-180.0	162
9	145.06	146.60	117.5	107.5-117.5	100
10	144.51	146.77	117.5	107.5-117.5	100
11	115.19	116.70	127.5	117.5-127.5	110
12	134.53	136.49	112.5	102.5-112.5	93
13	100.68	102.69	112.5	102.5-112.5	104
14	137.88	139.73	152.5	142.5-152.5	134
15	64.28	66.21	72.5	62.5- 72.5	54
16	46.89	49.89	42.5	32.5- 42.5	26
17	192.63	194.66	152.5	142.5-152.5	132
18	161.33	163.49	122.5	112.5-122.5	104

(ft msl) = feet above mean sea level datum

into the annular space between well casing/screen and the borehole to approximately 3 to 4 feet (ft) above the screened interval and then capped with one foot of fine-grained sand. Portland Class A cement was then tremmied in the annular space up to the surface and an 8-inch-diameter locking steel security casing was installed with an 18-inch-diameter apron at its base. Development consisted of airlifting and then by pumping with a submersible pump. Each well was developed approximately four hours or until the water produced was clear and free of fine sediments. An alternative method of swabbing and bailing was also used for monitor well 7 due to low yield and because it was screened just below the surface of the water table. All equipment was washed with a high pressure washer and steam cleaned between each site to avoid cross-contamination between wells.

Surveying

After completion of the monitor wells, the elevation of the top of the PVC casing of each well and the adjacent land surface were measured by a certified surveyor (Nichol Engineering Associates, Inc., Pensacola, Florida). The top of the PVC casing serves as a reference point from which all water levels are measured. Top of casing and land-surface elevations, referenced to mean sea level, are presented in Table 1.

Soil/Water Sampling and Analyses

One surface water, 16 ground-water, and 46 soil samples were collected at the site for chemical analyses. Soil samples were collected with a split-spoon sampler or, in the case of shallow samples, by a hand-operated auger sampler. Ground-water samples were collected from the monitor wells by first evacuating three to five volumes of standing water in the well using a submersible pump and then obtaining a sample using a bottom-entry Teflon bailer. Temperature, pH, and specific conductance of all water samples were measured at the time of collection. Sample handling, preservation, and chain-of-custody were carried out in strict compliance with the Quality Assurance Project Plan for Hydrogeologic Investigations at NAS Whiting Field, Florida, April 1986 (QA Plan). All chemical analyses were performed by an independent laboratory (Pioneer Laboratory, Inc., Pensacola, Florida) approved under the Navy's Quality Assurance (QA) Program for analytical work performed for NACIP.

HYDROLOGIC SETTING

Location

NAS Whiting Field is located in north-central Santa Rosa County, approximately seven miles north of the town of Milton and 20 miles northeast of Pensacola. The station is divided into two fields; the North Field is used for fixed-wing training and the South Field is used for helicopter training.

Climate

The climate of northwest Florida is generally humid, subtropical, with warm summers and mild winters. Temperatures average 81°F in the summer and 54°F during winter months. Rainfall is abundant, generaly ranging from 53 to 67 inches per year. During the fall months, short-term dry spells are frequent.

The two dominant wet periods occur in late winter or early spring and during June through August. The period occurring during late winter-early spring is generally the result of thunderstorm activity caused by warm moist air moving in from the Gulf of Mexico (Wagner, et al., 1980).

Topography and Drainage

Whiting Field is located on an upland area with elevations as great as 190 ft msl (feet above mean sea level) and bounded on three sides by the erosion of the deep valleys of Clear Creek on the south and west and Big Coldwater Creek

on the east, both of which are tributary to Blackwater River to the south. Ancient marine terraces can be seen in the nearly level upland surface and on the valley slopes southeast of the base at elevations of 70 and 30 ft msl. Clear Creek and Big Coldwater Creek are classified by the FDER as Class III Surface Waters and the Blackwater River is classified as an Outstanding Florida Water. Outstanding waters are considered to be of exceptional recreational and ecological significance.

Because of the relatively steep valley walls and the ±100 ft drop in elevation between NAS Whiting Field and the receiving creeks, erosion became a serious problem when the land was disturbed for construction of the base. Soil conservation measures in the form of extensive contouring and construction of large paved ditches were instituted to control surface runoff from the upland area of the base. This system of ditches and storm sewers conveys surface-water runoff to Clear Creek and Big Coldwater Creek. These and other surface-water drainage features are shown in Figure 4.

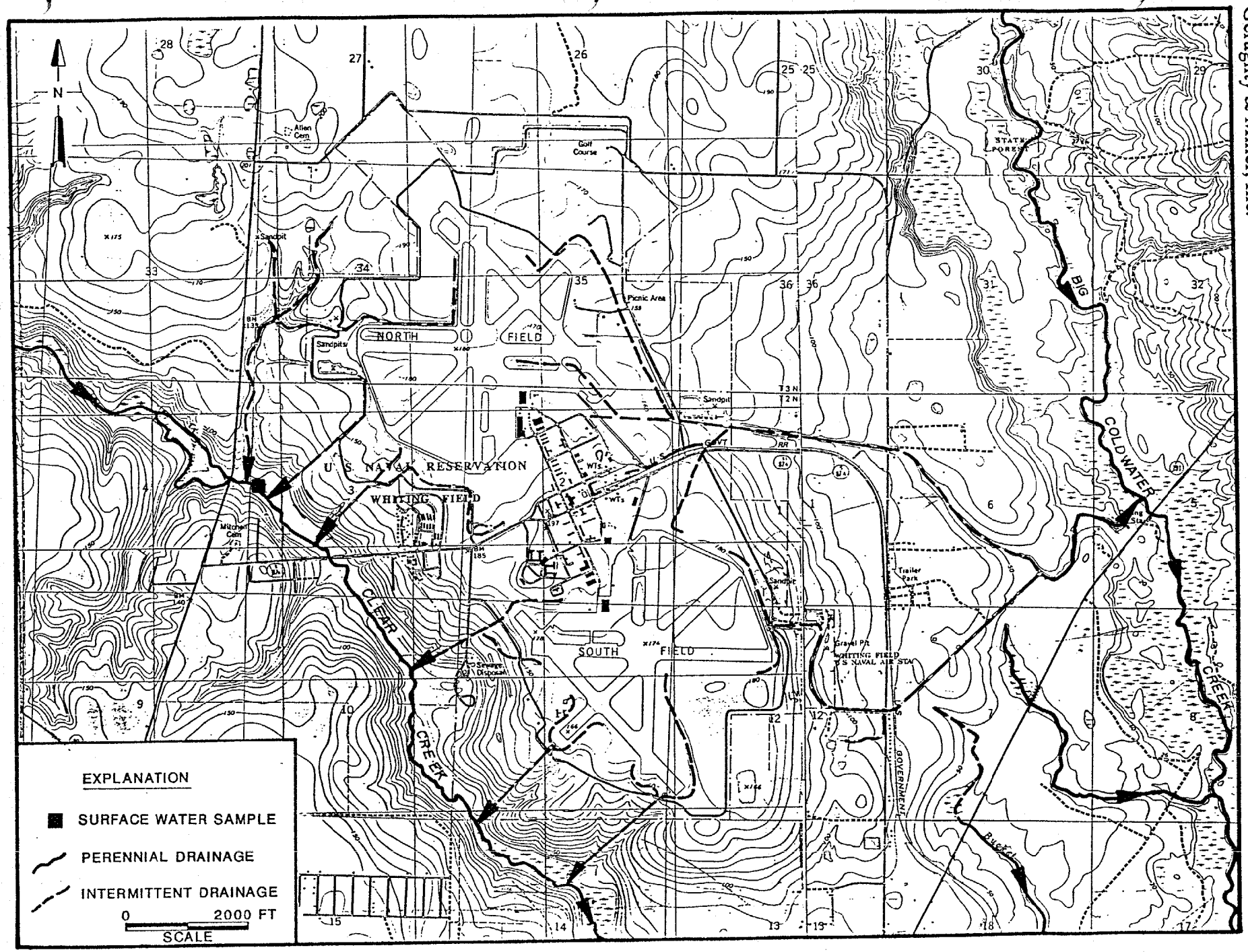


FIGURE 4. Locations of Surface Drainage Features.

GROUND-WATER SYSTEM

Geologic Framework of the Study Area

The geologic sequence of subsurface deposits and the corresponding hydrogeologic units underlying Whiting Field are illustrated in Figure 5, a composite geologic column constructed from published data and logs of wells in the area. Lithologic logs of borings and wells in the Whiting Field area and their locations are included in Appendix A.

The three major ground-water aquifers within the region are the surficial sand and gravel aquifer, the Upper Floridan limestone aquifer, and the lower Floridan limestone aquifer. The most important aquifer with respect to this investigation is the sand and gravel aquifer because it is the uppermost water-bearing zone and virtually all ground water in the county is pumped from it, including three water-supply wells at Whiting Field.

Sand and Gravel Aquifer

The uppermost sediments, extending to a depth of about 350 ft, comprise the sand and gravel aquifer which is subdivided into two units. The water-table or upper part of the sand and gravel aquifer does not constitute a source for large water supplies; however, its primary importance is to recharge the lower more productive zone of the aquifer. According to an aquifer test in the Milton area, the clayey sand confining unit separating the upper and lower is very

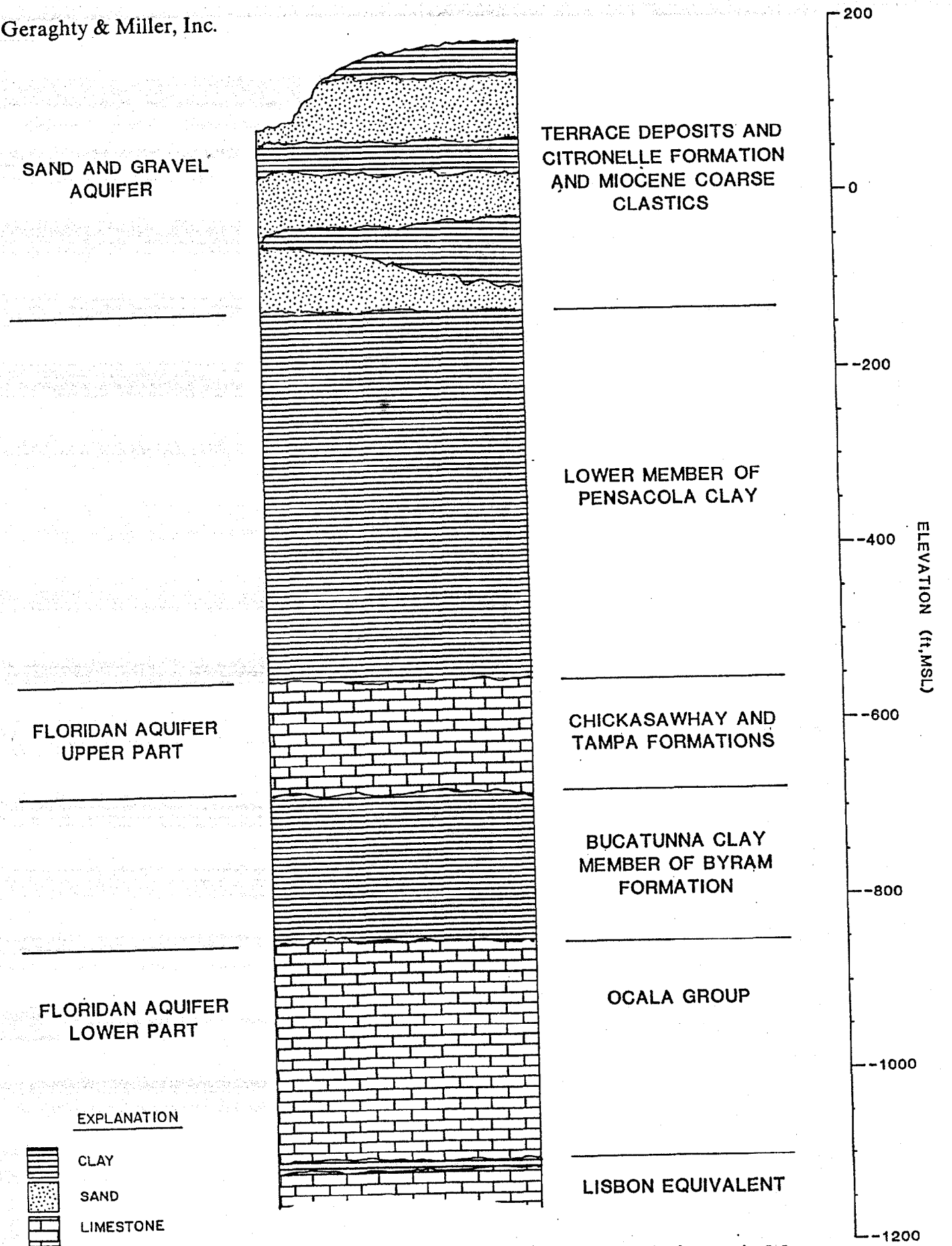


FIGURE 5. Generalized Geologic Column of the Whiting Field Area.

leaky. Most large capacity wells in the area, such as the NAS Whiting Field supply wells, are screened into the lower part of the aquifer from about 180 to 330 ft bls (feel below land surface).

The sand and gravel aquifer includes the upper Miocene coarse clastics, the Citronelle formation, and marine terrace deposits, three units which have similar hydraulic properties and sometimes are indistinguishable. The aquifer consists of poorly-sorted, fine to coarse sands with gravel and lenses of clay which may be as much as 60-ft thick. In some areas, the formation also contains wood fragments of all sizes, including whole tree trunks, occurring mostly in layers which may be as much as 25-ft thick (Marsh, 1966); however, logs of wells drilled on base do not indicate the presence of wood fragments.

The formation contains lensatic zones within the sand which are cemented by iron-oxide minerals. These lenses, known locally as "hardpan," have lower permeabilities and, along with the clay lenses, are responsible for the occurrence of perched water tables and semi-artesian conditions in the aquifer. In the Whiting Field area, clay lenses occur in the uppermost 30 ft and in the depth interval of approximately 110 to 170 ft (elevation 10-70 ft msl). Based on past drillers' log of the production wells, the vertical positions of these clay lenses in relation to the

screened intervals of the NAS supply wells are shown in Figure 6. Although the clays appear to be continuous, they may contain permeable zones or "windows."

The water from the sand and gravel aquifer is considered to be of excellent quality. Total dissolved solids and total hardness are generally less than 50 mg/l (milligrams per liter). However, because of high levels of dissolved carbon dioxide, the water is acidic with an ambient pH as low as 5.0 and locally contains high concentrations of iron.

Floridan Aquifer

Underlying the sediments of the sand and gravel aquifer is a thick (±300 ft), relatively impermeable Pensacola clay, below which are thick layers of limestone and shale to a depth of nearly 2,000 ft.

The limestone layers constitute the regionally extensive Floridan aquifer which, in this area, is divided into an upper and lower part separated by the Bucatana clay. The upper Floridan aquifer is an important source of water in areas east of Santa Rosa County; however, toward the west, it is increasingly mineralized and is generally not used as a water supply. The lower Floridan aquifer is highly mineralized in the Whiting Field area and is, in fact, designated for use as a waste-disposal injection zone. The Floridan aquifer receives little or no recharge from the sand

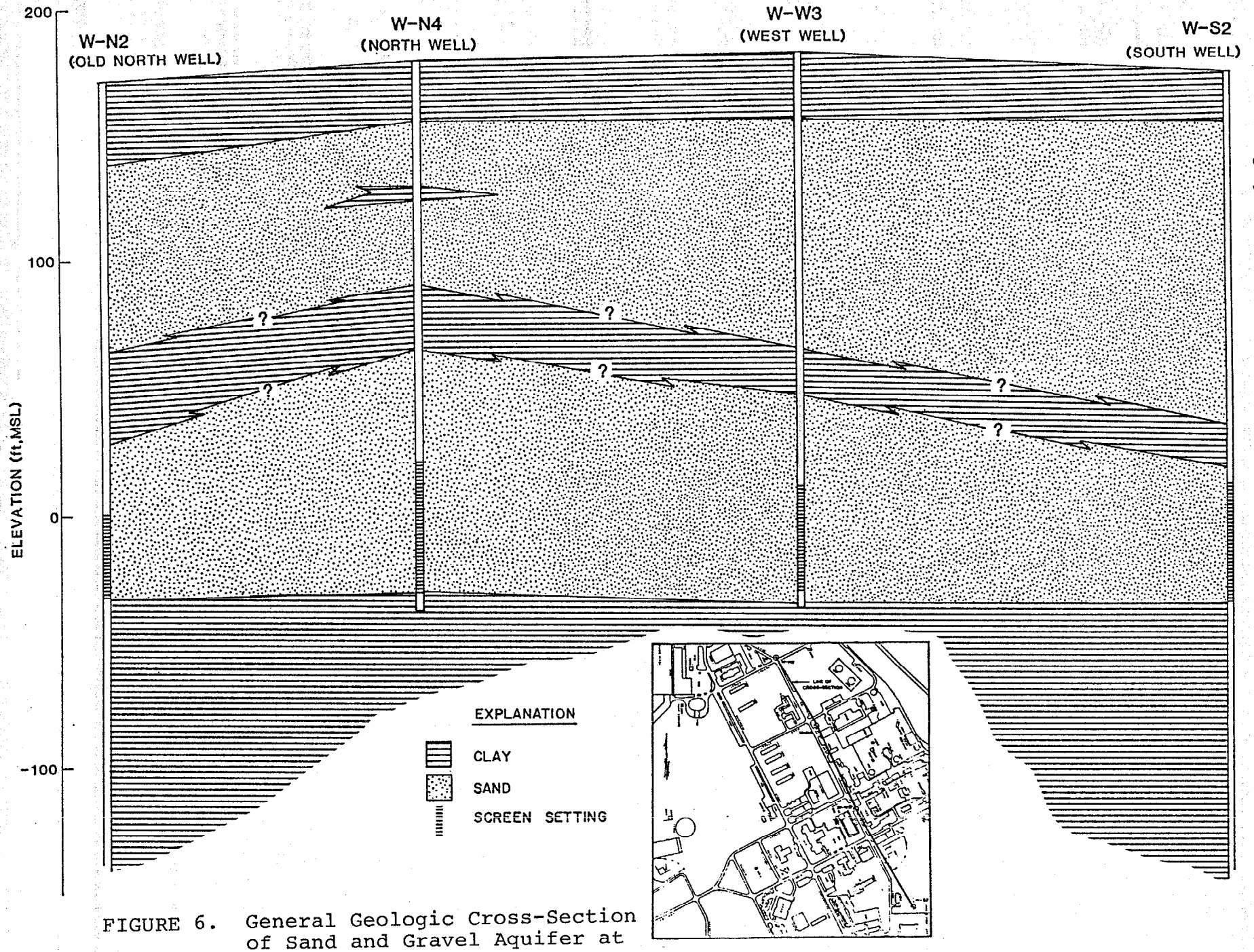


FIGURE 6. General Geologic Cross-Section of Sand and Gravel Aquifer at Whiting Field.

and gravel aquifer because of the Pensacola clay confining unit. The potentiometric surface of the Floridan aquifer in the NAS Whiting Field area is about 50-55 ft msl and the direction of flow is southeast.

Well Inventory

Essentially all potable and industrial water supplies in the Whiting Field vicinity are obtained from the sand and gravel aquifer, which extends from the surface to an approximate elevation of -150 ft msl (feet mean sea level). Screen settings are at depths of about 150 to 350 ft, depending on surface elevation and the occurrence of clay lenses which lie at somewhat erratic depths. An inventory of wells within one mile of the waste-disposal sites is presented in Table 2 and the locations of the wells are shown in Figure 7. The area includes most of Whiting Field and small residential neighborhoods south and east of the base.

Potable water on base is currently supplied by three wells: the north (W-N4), south (W-S3), and west (W-W3) wells; however, these are only the latest in a sequence of wells which have been replaced because of insufficient capacity or poor water quality. When the base was built in 1943, three wells were drilled: the original north (W-N1), south (W-S1), and west (W-W1) wells. In 1951 these wells were abandoned and replaced by new wells (W-N2, W-S2, and W-W2, respectively) within 75 ft of the original wells. The new wells were probably constructed to deliver increased yields.

Table 2. Inventory of Wells Within One Mile of Disposal Sites.

Well Designation	Owner	Date Installed	Casing Diameter (inches)	Surface Elevation (ft msl)	Total Depth (ft msl)	Screened Interval (ft msl)	Gravel Pack Interval (ft msl)	Status
W-N1	Navy	1943						Abandoned 1951
W-N2	Navy	1951	16	168.1	(-256.4)	(-1.4)-(-31.4)	60-(-31)	Not in use
W-N3	Navy	1975		171.5	(-58.5)	36.5-(-23.5)		Abandoned 1975
W-N4	Navy	1975	6/12	180.0	(-38)			In use
W-W1	Navy	1943						Abandoned 1951
W-W2	Navy	1951		197.6	(-157.4)	14.1-(-47.0)		Abandoned 1965
W-W3	Navy	1965		180.0	(-35.0)	10.0-(-30.0)	80-(-30)	In use
W-S1	Navy	1943						Abandoned 1951
W-S2	Navy	1951		181.5	(-159.5)	12.0-(-33.0)	17-(-33)*	In use
P-3	Point Baker Water System	1978		200**	(-20)**			In use
P-4	Point Baker Water System	1983						In use
USGS	U.S. Geological Survey	1974	6	125.0	(-1165)	Cased to (-860)		Monitor well

* Assumed
** Estimated

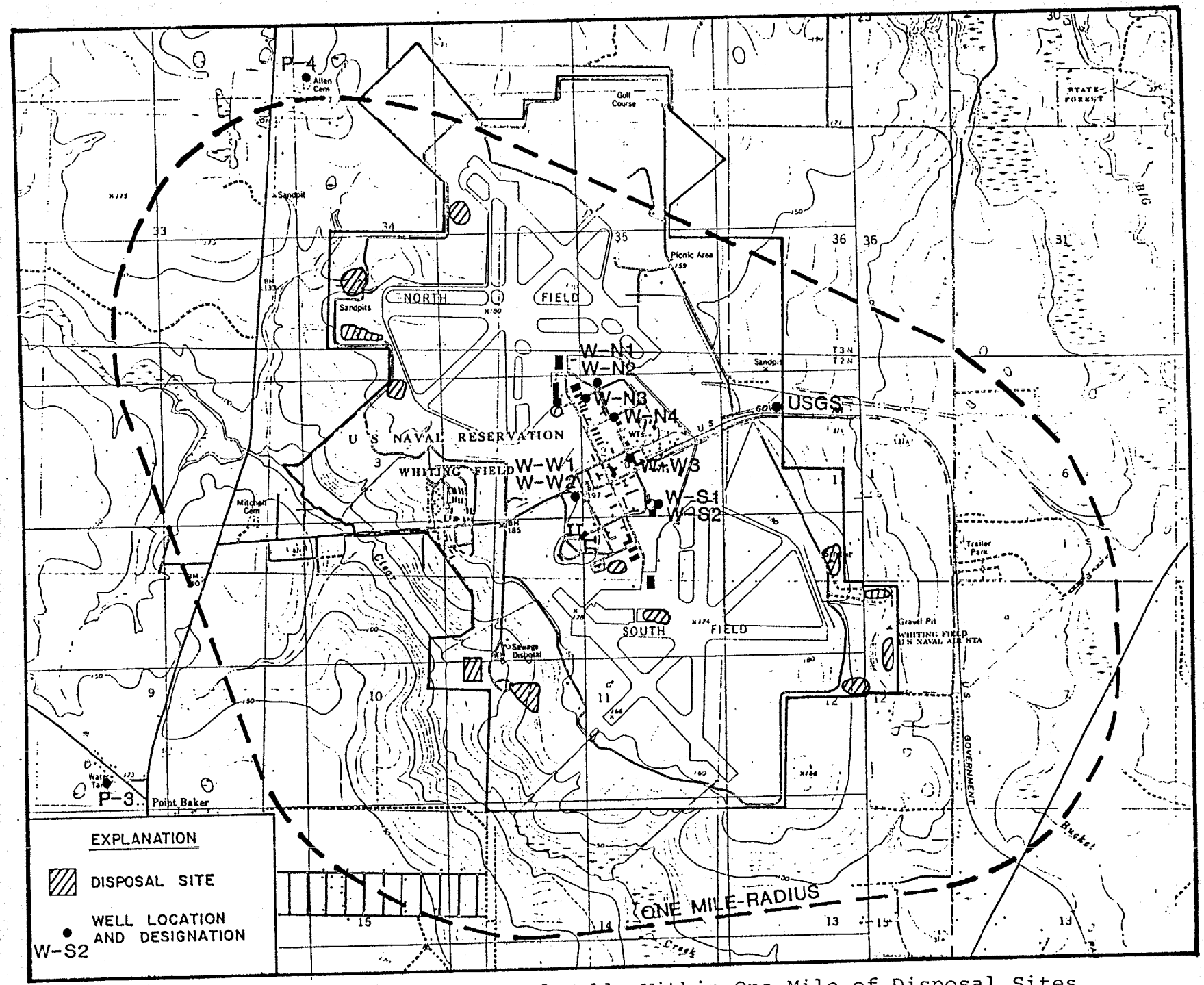


Figure 7. Locations of Wells Within One Mile of Disposal Sites.

The west and north wells, however, contained objectionable levels of iron and were replaced by W-W3 in 1965 and W-N3 in 1975, respectively. The replacement north well, which was drilled as a test well, was also found to have an unacceptable iron concentration and was subsequently abandoned and replaced by the currently used north well (W-N4). Locations of the active Navy wells are shown in Figure 8. Current average pump capacity from the wells at Whiting Field is: North well, 600 gpm (gallons per minute); West well, 700 gpm; and South well, 450 gpm. Flow from the three active supply wells is treated before entering the distribution system. Treatment consists of chlorination, pH adjustment, and addition of a sequestering agent to reduce iron precipitation.

Presently, only the north supply well W-N4 is pumping and supplying water to NAS Whiting Field. Per the FDER's request, supply well W-S2 was shut down on August 28, 1986, due to concentrations of benzene exceeding the state's drinking-water standard of 1 ug/l (micrograms per liter) in the ground water; subsequently, supply well W-W3 was also shut down on September 25, 1986, due to concentrations of trichloroethene greater than 3 ug/l in the water. Presented in Appendix D are the results of chemical analyses of the water from the three supply wells, conducted primarily in conjunction with the on-going Battery Shop investigation.

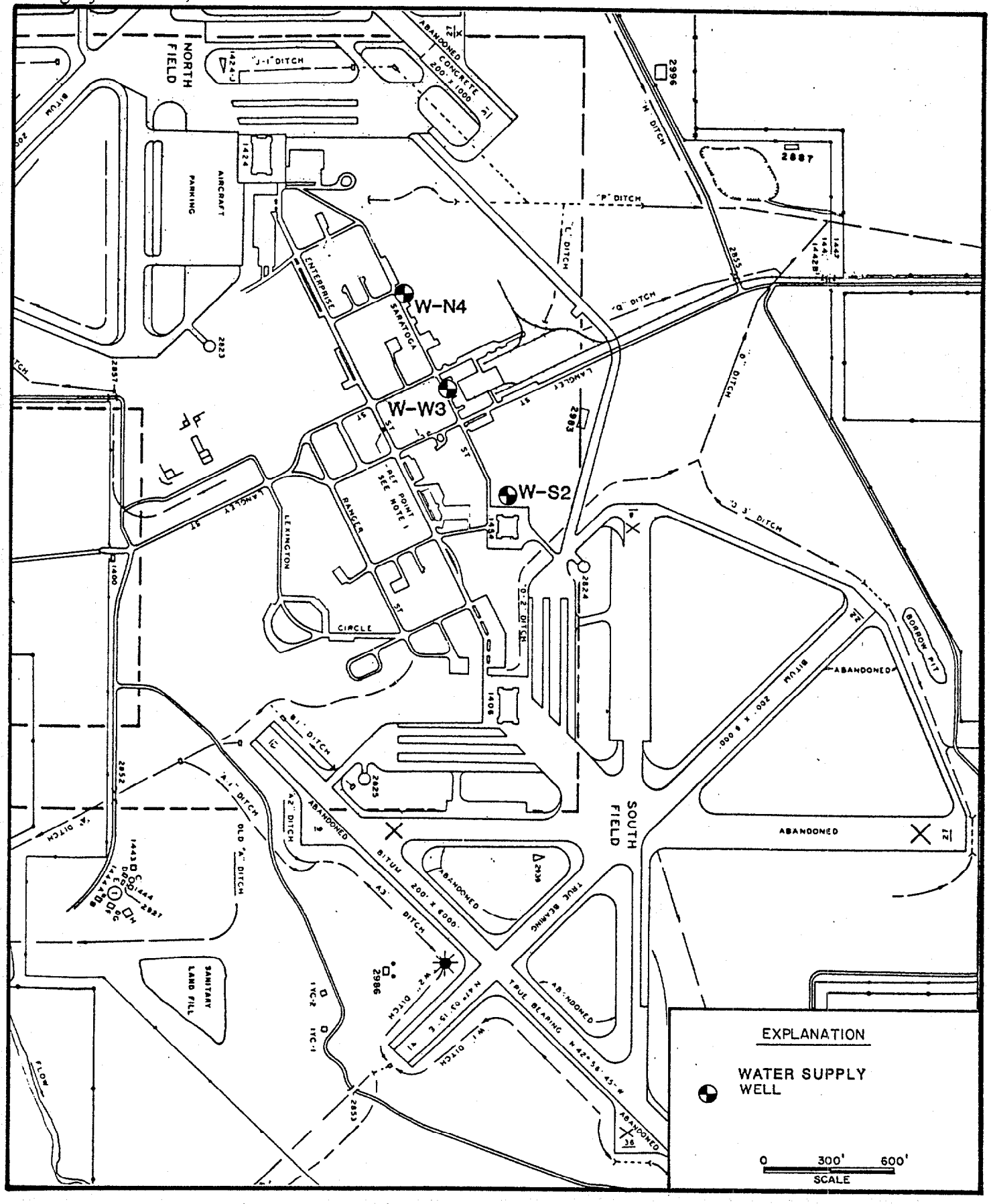


FIGURE 8. Locations of Active Water-Supply Wells.

Water for the City of Milton is supplied by five wells, for East Milton by two wells, and for the Point Baker-Allentown area by three wells, all of which are screened in the sand and gravel aquifer and all of which are outside of the one-mile radius; however, two of the Point Baker wells (P-3 and P-4) are close enough that they are included in the inventory. Average pumpage from these two wells is: P-3, about 500 gpm; and P-4, about 200 gpm. Water from the Point Baker system is available to residences west and north of Whiting Field, and water from the Milton system is available to those east and south of Whiting Field. It is believed that few if any private wells in these areas are still used.

SITE-SPECIFIC SUBSURFACE HYDROLOGY

Geology

Based on the lithologic logs of the monitor wells drilled during the field investigation (Appendix A), most of the NAS is capped by low-permeable sediments consisting of sandy clay or clay ranging in thickness from about 20 to 80 ft. The exception was found at Sites 1 and 18, located along the west side of the North Field, where these clayey sediments were absent at the surface. Generally, to the total depths of the wells drilled (42 to 180 ft), the lithology is described as fine to coarsed-grained sand with randomly interbedded lenses and layers of gravel and clay. Figure 9 illustrates a subsurface cross-sectional view across the NAS.

Ground-Water Movement

The sand and gravel aquifer is recharged by infiltration of rainwater at the surface. The downward movement of water through the unsaturated zone can be impeded by clay layers, where they exist, resulting in intermittent perched water tables. During the installation of the initial monitor well at Site 5, the presence of perched water tables was investigated. This was accomplished by setting the well screen at several different depth intervals as the borehole was advanced. No saturated zones within the upper 120 ft of sediment were found. Likewise, during the drilling

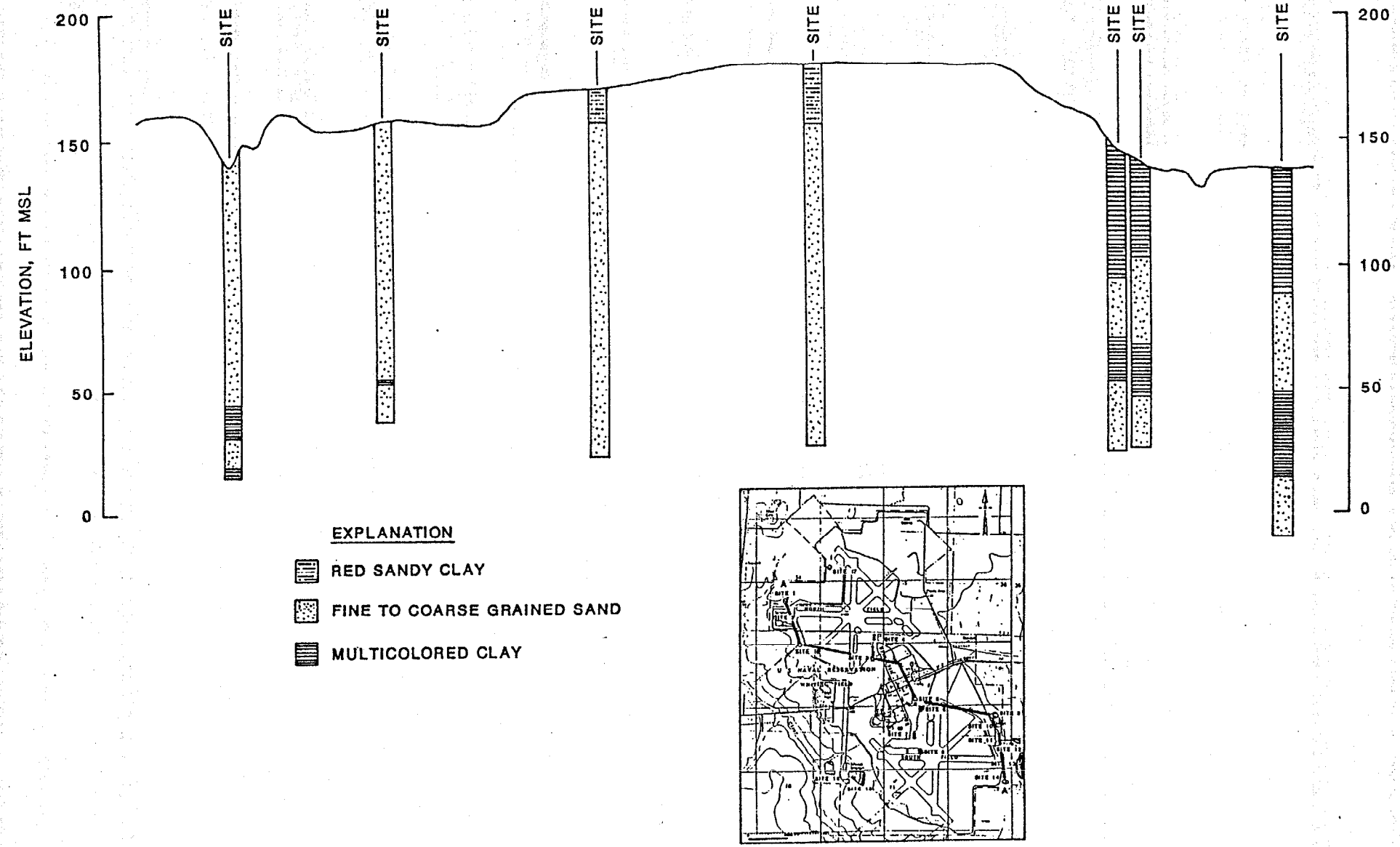


FIGURE 9. Geologic Cross-Section of Uppermost Sediments.

operations of all other wells installed at the site, there were no indications that water-yielding zones existed above the zones tapped by the monitor wells.

Water levels in the monitor wells installed in the upper part of the sand and gravel aquifer ranged from about 80 ft msl in the north to 45 ft msl in the south of the base, as shown by the water-table contour map presented in Figure 10. Water-level measurements in the monitor wells were made on October 17, 1986, when only the north supply well W-N4 had been pumping for several weeks. No obvious effects (drawdown) in the water levels of the upper sand and gravel aquifer are indicated by the water-table map, which is due in part to the steep hydraulic gradient at the site. Water levels ranged from 11 ft to 130 ft bls and generally are directly related to the topography; that is, the greatest depths to the water table occured at the highest topographic locations and the shallowest depths to water occurred at the lowest topographic locations. The direction of ground-water flow across the site is generally southeast to south and southwest.

Water levels measured in supply wells W-S2 (62.51 ft msl) and W-W3 (64.42 ft msl) (tapping the lower sand and gravel aquifer) while they were shut down were compared to water levels in nearby monitor wells (tapping the upper sand and gravel aquifer) installed for this study. The comparison did not show a significant difference in head between the two

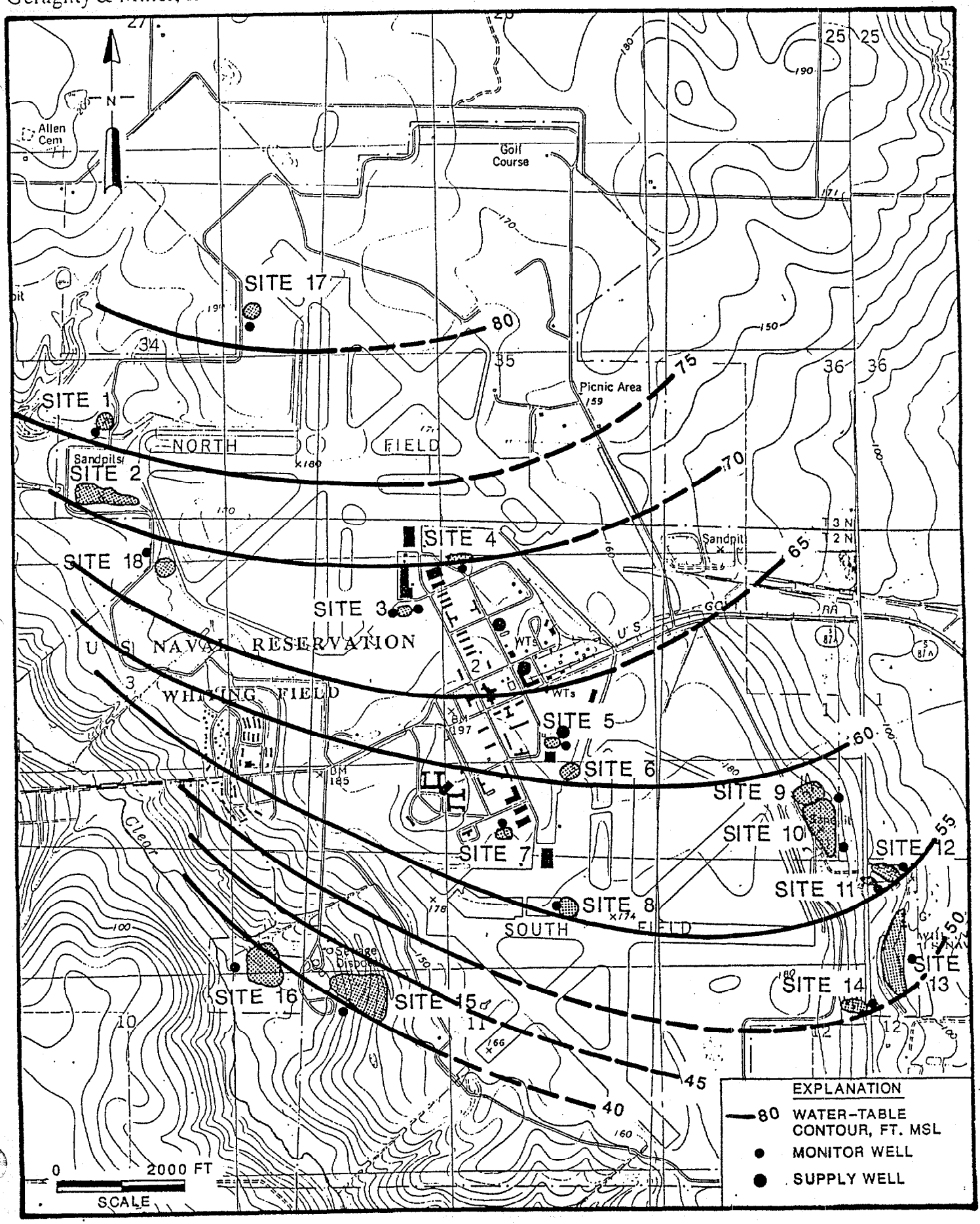


FIGURE 10. Water-Table Contours of Sand and Gravel Aquifer, October 17, 1986.

zones of the aquifer. This is best exemplified at Site 5 (Battery Shop site) where four upper sand and gravel wells (GMW-1 through GMW-4) are in close proximity to supply well W-S2. Differences in water levels between the two zones were no greater than a few tenths of a foot. A pumping test conducted at Site 5 (Battery Shop) suggested that the upper aquifer and the lower production zone of the aquifer are hydraulically connected, although flow between the two zones is impeded by clayey sediments.

Hydraulic Properties

Published information of the hydraulic properties of the sand and gravel aquifer is scarce. The following specific capacities were determined from test pumping of the NAS wells installed in 1951: W-N2 16.7 gpm/ft (gallons per minute per foot of drawdown), W-W2 23.0 gpm/ft, and W-S2 21.7 gpm/ft. From these values, an average minimum transmissivity for the lower zone of the sand and gravel aquifer is estimated to be about 37,000 gpd/ft (gallons per day per foot). This agrees rather well with a transmissivity of 54,600 gpd/ft determined from a pumping test at Milton (Wagner, et. al., 1980) and with the transmissivity estimated from well W-S2 during the Battery Shop study (30,000 gpd/ft).

Short-term specific capacity tests were run on all the monitor wells after development. Using an empirical relationship, the average minimum transmissivity of the upper

saturated part of the sand and gravel aquifer was estimated to be about 4,700 gpd/ft.

Water Quality

The chemical parameters analyzed from water samples collected at each site are described in the following section of the report entitled "Site Assessments." At most of the sites where a monitor well was installed, ground-water samples were collected and analyzed for EPA's list of priority pollutants, which includes 115 organic compounds (volatiles, acid and base/neutral extractables, and pesticides) and 13 metals in addition to cyanide and phenols.

Specific conductance and pH measurements of all water samples were also determined in the field and the values are listed in Appendix B. Measurements for pH were considered to be artificially high, ranging from 6.3 to 10.20. It is believed that the high pH of the water samples is due to cement used to construct the wells, and in time this will become less of an influence to the ground water near the monitor wells. Specific conductance values were generally low (less than 200 umhos/centimeter); higher values (315-650 umhos/centimeter) occurred at monitor wells 10, 12, and 13 located in the southwestern part of the base.

SITE ASSESSMENTS

Northwest Disposal Area (Site 1)

Background

Site 1 is located on the west side of the North Field. This five-acre site was used as a general refuse disposal area from 1943 until around 1965 (Figure 11). Wastes disposed of at this site included general refuse and possible unknown quantities of waste paints, paint thinners, solvents, waste oils, and hydraulic fluids. The site is a surface depression and most of the on-site rainfall infiltrates directly into the soil; however, any surface-water runoff that might occur would be along the southwestern edge and would be intercepted by a concrete drainage ditch (designated as E ditch) that runs near the southern boundary of the site and conveys surface water to Clear Creek.

Monitor well 1 was installed to a depth of 122 ft adjacent to and southwest of the site, as shown in Figure 11; depth to the ground-water surface was about 66 ft. A ground-water sample was collected from the monitor well and a surface-water sample was collected from Clear Creek, downstream of the site (Figure 4). Both samples were analyzed for EPA's list of priority pollutants, which includes VOCs (volatile organic compounds), acid and base/neutral extractable organic compounds, pesticides (including endrin,

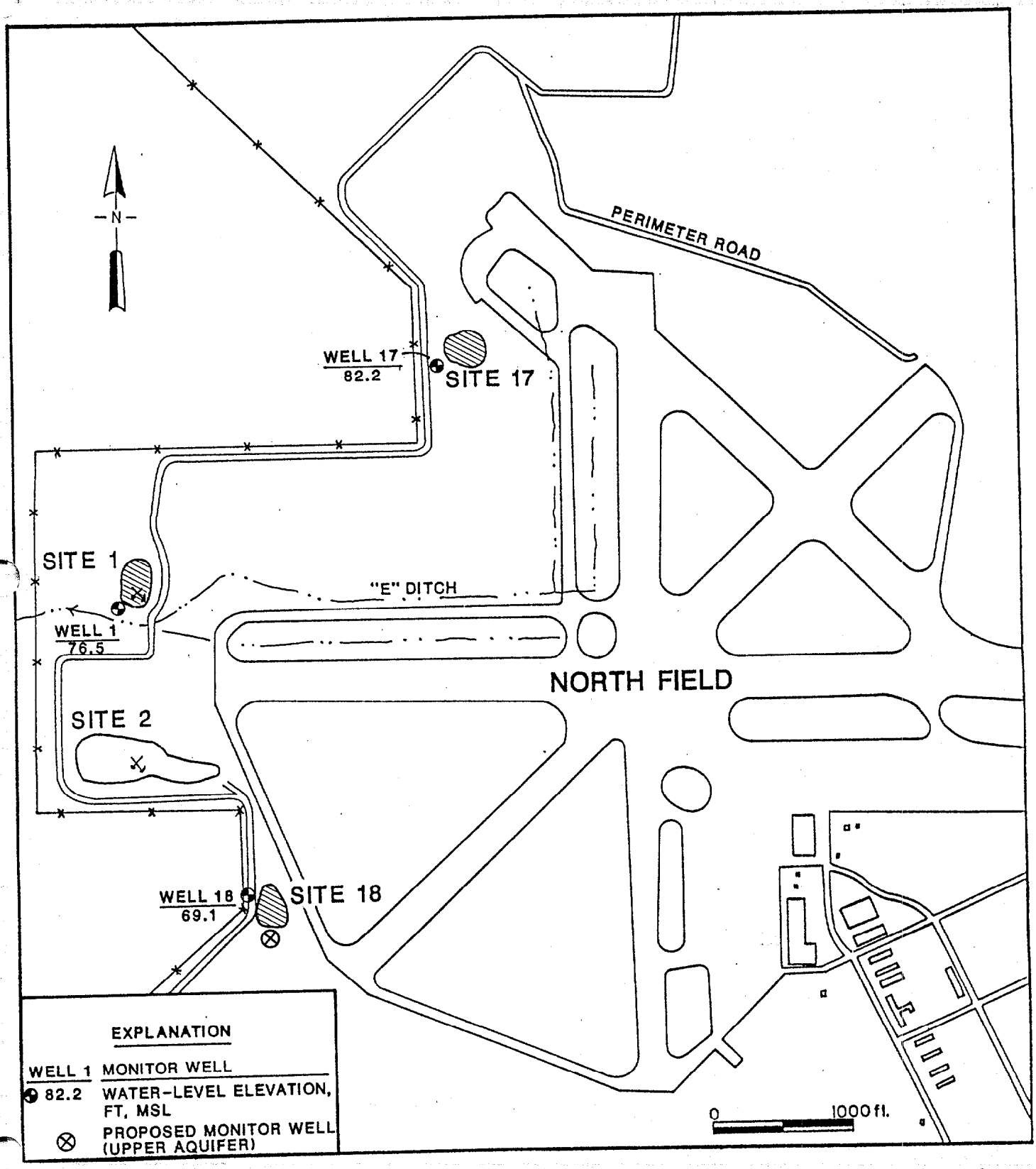


FIGURE 11. Location of Northwest Disposal Area (Site 1), and Crash Crew Training Areas (Sites 17 and 18).

lindane, kepone, toxaphene, chlorodane, malathion), herbicides, (2,4-D and 2,4,5-TP Silvex), PCBs (polychlorinated biphenyls), and metals.

Findings and Recommendations

The laboratory analyses of both water samples (Appendix C) did not detect any contaminants except for trace levels of lead, which are well below the State of Florida's primary drinking-water regulations (FAC 17-22.104). Based on these results, no adverse impacts to the water resources are judged to have occurred from this site. Even though no contaminants were detected at Site 1, it is recommended that a follow up water sample be collected from monitor well 1 and Clear Creek and analyzed for VOCs and metals. Upon confirmation of the original results, no further study of this site will be recommended.

Crash Crew Training Areas (Sites 17 and 18)

Background

During the last 25 years, two general areas near the west side of North Field have been used for fire-fighter training. Presently, Sites 17 and 18 (Figure 11) are being used; however, the specific training locations have periodically been relocated within the boundaries of the two sites. During a training session, approximately 110 gallons of JP-4 fuel is poured into shallow surface depressions, ignited, and then extinguished using an aqueous film-forming

foam (AFFF). According to the NAS records, 6,285 gallons of fuel and 3,148 gallons of AFFF were used during the last year (1984).

One monitor well tapping the uppermost part of the aquifer was installed adjacent to Site 17 (152 ft deep) and adjacent to Site 18 (122 ft deep) at the locations shown in Figure 11. The water-table surface was determined to be about 112 ft bls at Site 17 and about 94 ft bls at Site 18. Water samples collected from each well were analyzed for EPA's list of priority pollutants, including VOCs, acid and base/neutral extractable organic compounds, pesticides, PCBs, and metals.

Findings and Recommendations

Analyses of the ground-water samples from both sites (Appendix C) showed trace amounts of lead and mercury, which were below FDER's drinking-water standards. The only organic compound detected was bis (2-ethylhexyl) phthalate at 18 ug/l (Site 17) and 32 ug/l (Site 18). Upon investigating the composition of AFFF, it was learned that certain foams may contain minor amounts of particular phthlate esters (telephone communication with Mr. Tom Parker, Rockwood Systems Corporation, 10/14/86). Although drinking-water standards for phthalates have not been established, proposed EPA ambient water criterion for protection of human health has been calculated to be 15 mg/l or 15,000 ug/l (Sittig, 1985).

Based on the above, the presence of bis (2-ethylhexyl) phthalate does not appear to present an imminent hazard or risk to the environment at the two sites in question. However, it is suggested that another round of water samples from each well (17 and 18) be collected to confirm the low concentrations of the previous analyses and to verify the absence of fuel-based constituents. These samples will be analyzed for base-neutral extractable organic compounds and for benzene, toluene, and xylene according to EPA Method 625 and 602. Also, analyses will be performed for surfactants (as MBAS) and fluoride which can be common constituents of these types of fire-extinguishing agents.

In addition to the above, it is recommended that another monitor well be installed south of Site 18 and in a more downgradient direction into the upper part of the aquifer. Analysis of the ground water will be performed for the same constituents mentioned above.

Underground Waste Solvent Storage Area (Site 3)

Background

Site 3 is located on the southeastern side of the North Field (Figure 12). North supply well W-N4 is located about 1,400 ft southeast of the site. Two 500-gallon underground metal tanks were used from 1980 to 1984 for the storage of waste solvents and residue generated from paint-stripping operations. In April 1984, the two tanks were removed;

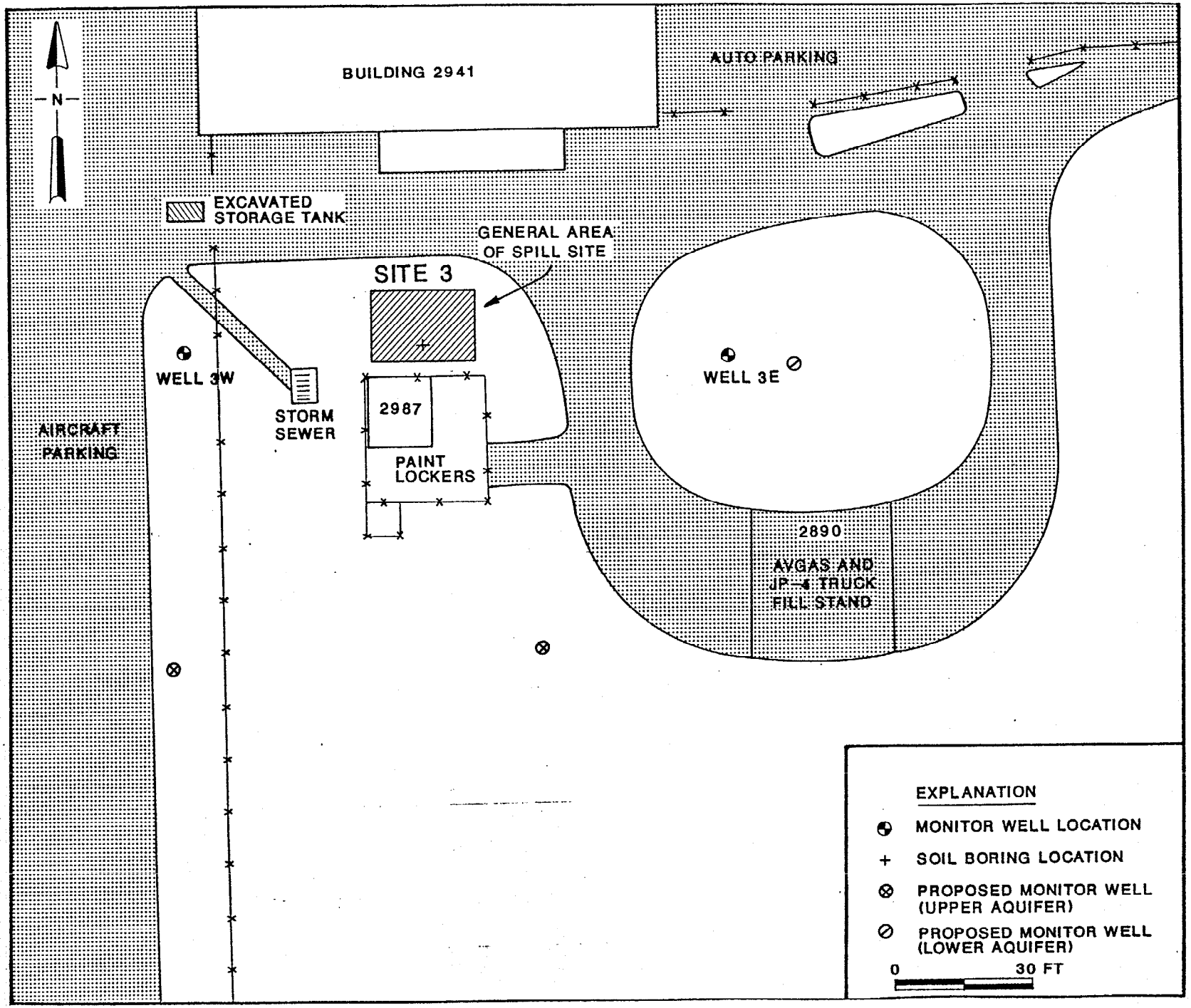


FIGURE 12. Site Plan of Underground Waste Solvent Storage Area.

however, during excavation, approximately 120 gallons of waste solvents accidentally spilled onto the ground. Clean-up operations conducted at the site resulted in the recovery of approximately 50 gallons of the waste solvent and approximately six cubic yards of contaminated soil were removed and disposed of off-site in an approved landfill. Subsequent examination of the tanks revealed two holes approximately 1/2-inch in diameter corroded through the tank walls. A partial chemical analysis of the waste contained in the tanks in 1981 is presented in Appendix C.

A soil boring was drilled at the spill site and split-spoon core samples were collected on 5-ft intervals to a total depth of 25 ft. Based on the samples collected, the soils to a depth of 20 ft consist primarily of red clay with minor amounts of sand (Appendix A). Within the interval of 20 to 25 ft, the lithology changed to a fine to medium-grained white sand.

Monitor wells 3E and 3W were installed about 50 ft east and 60 ft west of the site and tap the upper sand and gravel aquifer at a depth of 152 ft. The locations of the monitor wells and the soil boring are shown in Figure 12. Water levels in both wells are over 100 ft bls and their elevations essentially the same, only differing by a few hundredths of a foot.

Both the ground-water samples and the soil samples were analyzed for VOCs, benzene, toluene and xylene (BTX), methyl

isobutyl ketone (MIBK), phenols, and metals (including chromium, lead, cadmium, zinc, arsenic, barium, mercury, selenium, and silver). Analyses are presented in Appendix C.

Findings and Recommendations

No organic chemicals were detected in the soil samples to a depth of 25 ft except for phenols (0.61 ppm) at the surface, which probably is due to the vegetative matter in the uppermost part of the soil. Of nine metals analyzed for, five were detected in varying concentrations; Table 3 summarizes these results.

Table 3. Metals Analyses from Site 3 Soil Boring

Sample Depth (ft)	Concentrations, in mg/kg (ppm)				
	Zinc	Silver	Chromium	Cadmium	Mercury
0	586	0.92	43	0.28	0.20
5	2.6	1.85	29	<0.008	0.15
10	<0.8	1.74	24	<0.008	0.11
15	<0.8	0.98	7.1	<0.008	<0.01
20	<0.8	1.09	<1	<0.008	0.16
25	<0.8	0.75	<1	<0.008	0.22

The data show that zinc, chromium, and cadmium decreased to non-detectable levels with depth; silver and mercury were found in low concentrations to the depth of 25 ft. In general, all metals except mercury exhibited a decreasing trend of concentration with depth, indicating attenuation by the clayey soils.

Except for trace concentrations of arsenic and lead (below FDER's drinking-water standards), no metals were detected in the ground-water samples. However, to the west of the site in monitor well 3W, three chlorinated hydrocarbons were detected: 1,1,1-trichloroethane at 13 ug/l; 1,1,2-trichloroethane at 111 ug/l; and trichloroethylene at 18 ug/l. Based on the above-described findings, the ground water at Site 3 does not appear to be affected by metal contaminants. The ground water west of the "spill site," however, has been impacted by VOCs.

During the course of the field investigation, it was learned that a used oil storage tank located ±30 ft north of monitor well 3W existed until January 1986 (Figure 12). At that time, the tank was excavated and removed to provide space for an extension of the adjacent pavement used for aircraft parking. Reportedly, this storage tank was used for waste oils, spent hydraulic fluids, and possibly some solvents. Considering this new information, it is uncertain whether the source of VOCs in well 3W is from the original spill site or the old underground tank located north of the well. It should be noted that there are no reports that any problems were experienced with this tank.

Nevertheless, it is recommended that additional monitor wells be installed to the south of Site 3, as shown in Figure 12, to help establish source, direction of movement, and areal extent of these VOCs in the ground-water system. Two

of the proposed wells will be installed in the upper part of the aquifer and are located based on general direction of ground-water flow in the upper part of the aquifer (i.e., downgradient and south from the sites) and the physical constraints posed by the site's location. It is recommended that a third well be installed adjacent to well 3E in order to determine whether VOCs have migrated into the lower part of the aquifer and might have moved east toward the supply wells. The existing and proposed monitor wells will all be sampled and analyzed for VOCs and PCBs (EPA Method 624 and 608); the water levels in all monitor wells also will be measured to establish a better definition of ground-water flow directions and hydraulic gradients. In addition, two continuous water-level recorders will be installed for one month in the deep monitor well and one of the upper aquifer monitor wells to determine drawdown effects of the hydraulic connection between the two zones while monitoring the discharge rate from the supply well W-N4. A third recorder will be installed in an upgradient well (such as monitor well 1) outside the potential cone of influence of pumping well W-N4 to compare baseline fluctuations in the water table.

North AVGAS Tank Sludge Disposal Area (Site 4)

Background

Site 4 is located southeast of the North Field. The north supply well is located approximately 1,100 ft southeast of the site. The site contains nine underground steel tanks,

of which eight were used in the past for aviation gasoline (AVGAS) storage. The tanks date back to 1943 when NAS Whiting Field first began operations. These eight tanks are labeled 1467, A, B, C, D, E, F, and G (Figure 13). The past use of the ninth tank, "H," is not known, but presently is used for contaminated jet fuel storage. Of the nine AVGAS storage tanks, six have been filled with water; the remaining three (F, G, and H) are still used for storage of gasoline, diesel, and contaminated jet fuel, respectively.

From 1943 to 1968, the nine AVGAS tanks were cleaned out approximately every four years. The tank bottom sludge, which contained tetraethyl lead, then was buried at shallow depths in the area immediately adjacent to the surrounding tanks. It has been grossly estimated that 1,000 to 2,000 gallons of sludge were disposed of in this manner.

Findings and Recommendations

Soil samples were collected from the uppermost sediments consisting of sandy clay to a depth of 2 ft at the locations shown in Figure 13. Portions of these samples then were mixed together to produce a composite sample. This sample was split into two parts and analyzed for total lead content and subjected to EP toxicity tests for lead. Analyses of the two soil samples determined total lead concentrations of 15 and 27 mg/kg. The results of EP toxicity tests were favorable with no detectable lead at 0.01 mg/l.

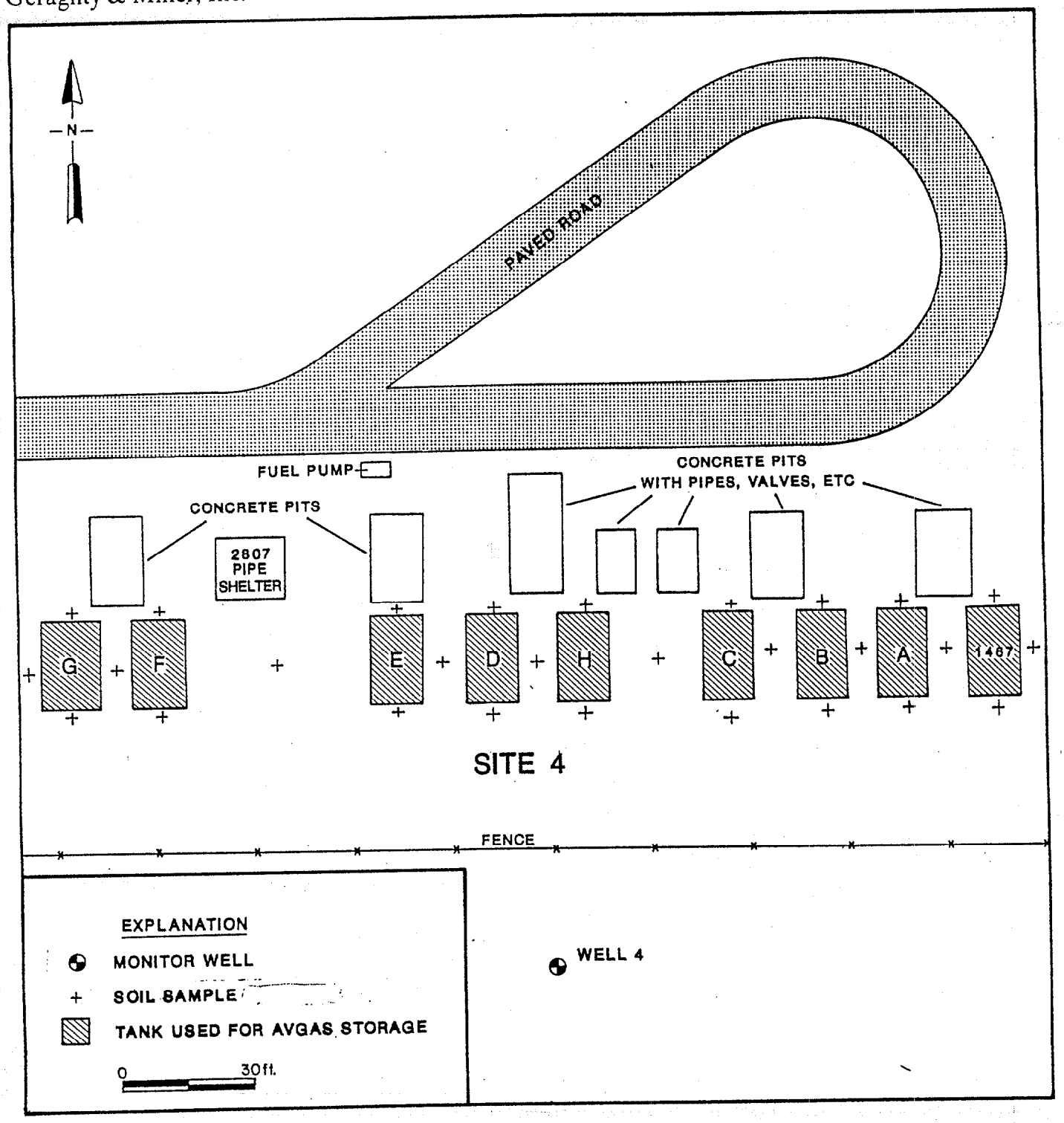


FIGURE 13. Location of North AVGAS Tank Sludge Disposal Area (Site 4).

A monitor well was also installed to a depth of 152 ft south of and adjacent to the site; depth to the ground-water surface was determined to be about 102 ft bls. The ground water was analyzed for the following constituents: BTX, napthalene, EDB, and lead. The analyses (Appendix C) showed benzene at 17 ug/l and toluene at 10 ug/l in the water samples. A trace of lead, significantly below FDER's drinking-water standard, was also detected.

Hydrocarbons are present in the ground water at the site based on the analysis of monitor well 4; in particular, benzene exceeds the state's drinking-water standard of 1 ug/l (FAC 17-22. 104[1][g]). Because of its proximity to water-supply well W-N4, installation of additional monitor wells is recommended. To assist in determining the potential movement of contaminants from Site 4, it is recommended additional monitor wells be installed primarily south of the site and between the site and supply well W-N4. These new wells (Figure 14) will be drilled into both the upper zone of the sand and gravel aquifer and the production zone of the water-supply wells to a depth of $\pm$200 ft to determine if downward migration of contaminants has occurred and to determine the potential direction of lateral movement in the ground-water system. The ground water from both the existing and proposed monitor wells will be sampled and analyzed for dissolved aromatic hydrocarbons (EPA Method 602) and water levels will be measured to establish whether vertical head gradients exist between the two zones of the aquifer.

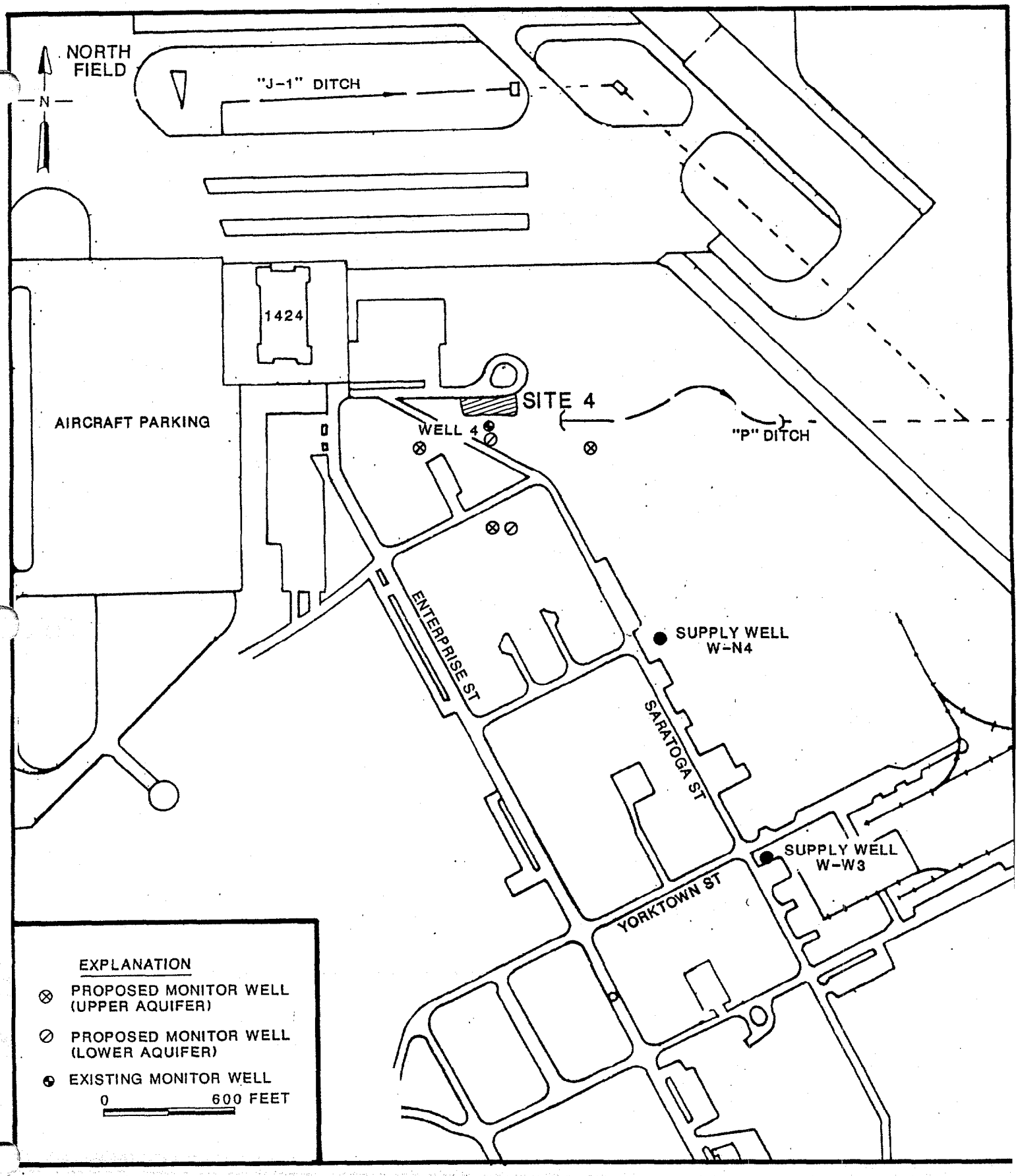


FIGURE 14. Locations of Proposed Monitor Wells for Site 4.

South Transformer Oil Disposal Area (Site 6)

Background

From the 1940's until 1964, dielectric fluid from transformers was reportedly drained into the grassed "0-2" ditch, which has since been paved. This fluid could have been contaminated with PCBs. The estimated area of disposal, shown in Figure 15, is located about 700 ft from supply well W-S2 and about 500 ft southeast of Building 1454. The "0-2" ditch drains in a northeasterly direction to the "0" ditch which connects to the "P" ditch and drains into Big Coldwater Creek. NAS Whiting Field's south supply well (W-S2) is located about 600 ft northwest of this old disposal area.

Findings and Recommendations

Ten soil samples were collected along the flanks of the paved ditch and analyzed for PCBs at the locations shown in Figure 15. The soils were described as typically sandy clay. Each sample was a composite sample from each location collected from the surface to a depth of 2 ft. The laboratory results (Appendix C) of the soil samples at Site 6 did not detect any PCBs above the detection limit of 0.2 mg/kg (milligrams per kilogram)(ppm).

The shallow soils in the area of suspected disposal of the oils do not show the presence of PCBs. In addition, previous analyses (EPA Method 608) of ground water from

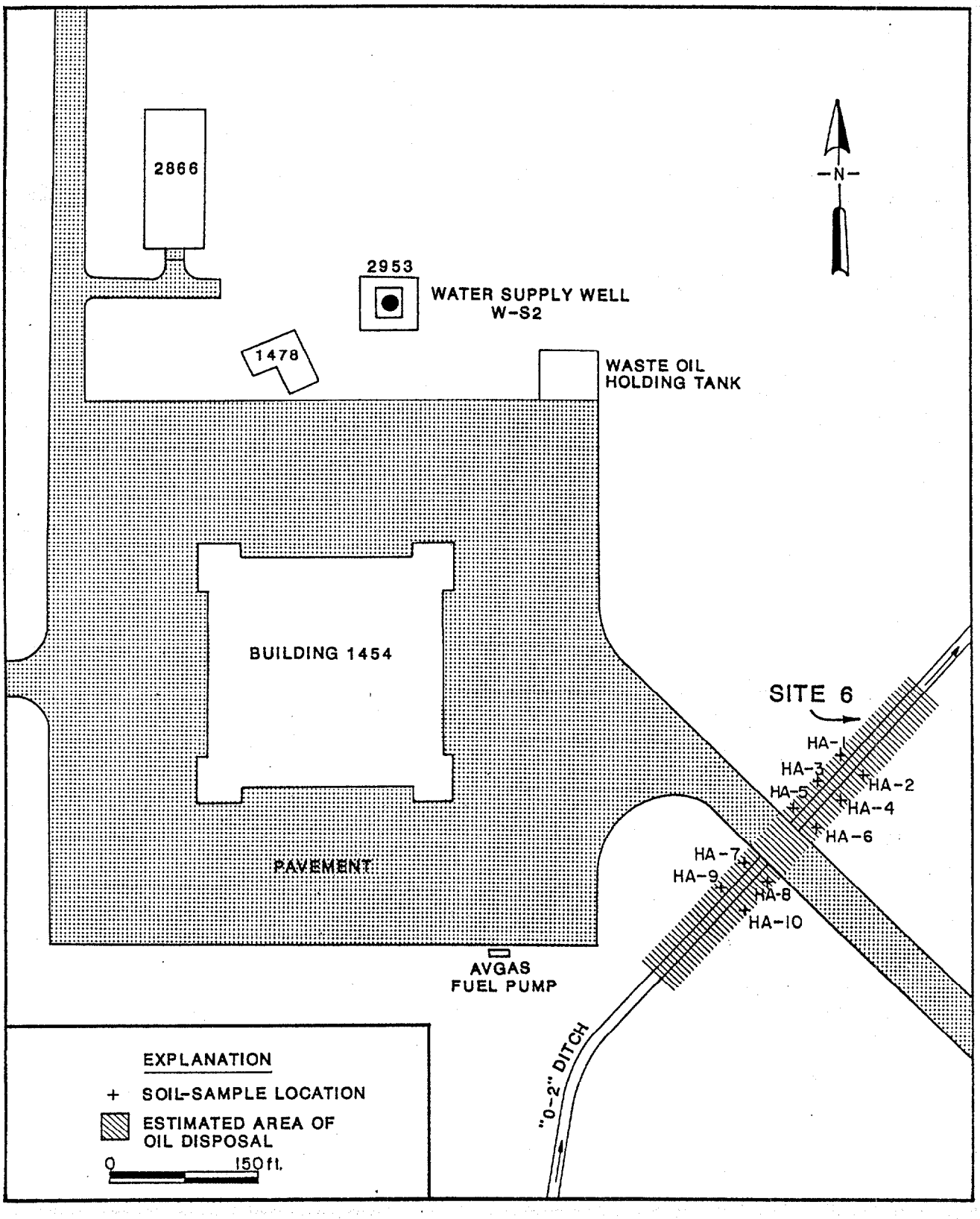


FIGURE 15. Location of South Transformer Disposal Area.

supply well W-S2 in November 1985, March 1986, and April 1986, did not detect any PCBs or other related compounds (see Appendix D). Based on this information, the site does not appear to be a threat to human health or the environment; therefore, no further study of this site is recommended.

South AVGAS Tank Sludge Disposal Area (Site 7)

Background

Site 7 is located northwest of the South Field and about 1,800 ft south of supply well W-S2 (Figure 16). It includes eight 23,700-gallon underground steel tanks and two 15,000 gallon lube oil storage tanks which were used for AVGAS and AVLUBE storage from 1943 to the late 1970's. Similar to Site 4, the tank bottom sludges, which contained tetraethyl lead, were buried at shallow depths in the area immediately surrounding the tanks. Roughly 1,000 to 2,000 gallons of sludge is believed to be buried throughout the tank farm. Presently, all but four of the tanks have been filled with water. These four active tanks are currently used for No. 2 fuel storage.

Findings and Recommendations

Soil samples of the uppermost sediments were collected to a depth of 2 ft at the locations shown in Figure 16. Portions of these samples were composited into two samples and analyzed for total lead content and EP toxicity for lead. A monitor well, also shown in Figure 16, was installed to a

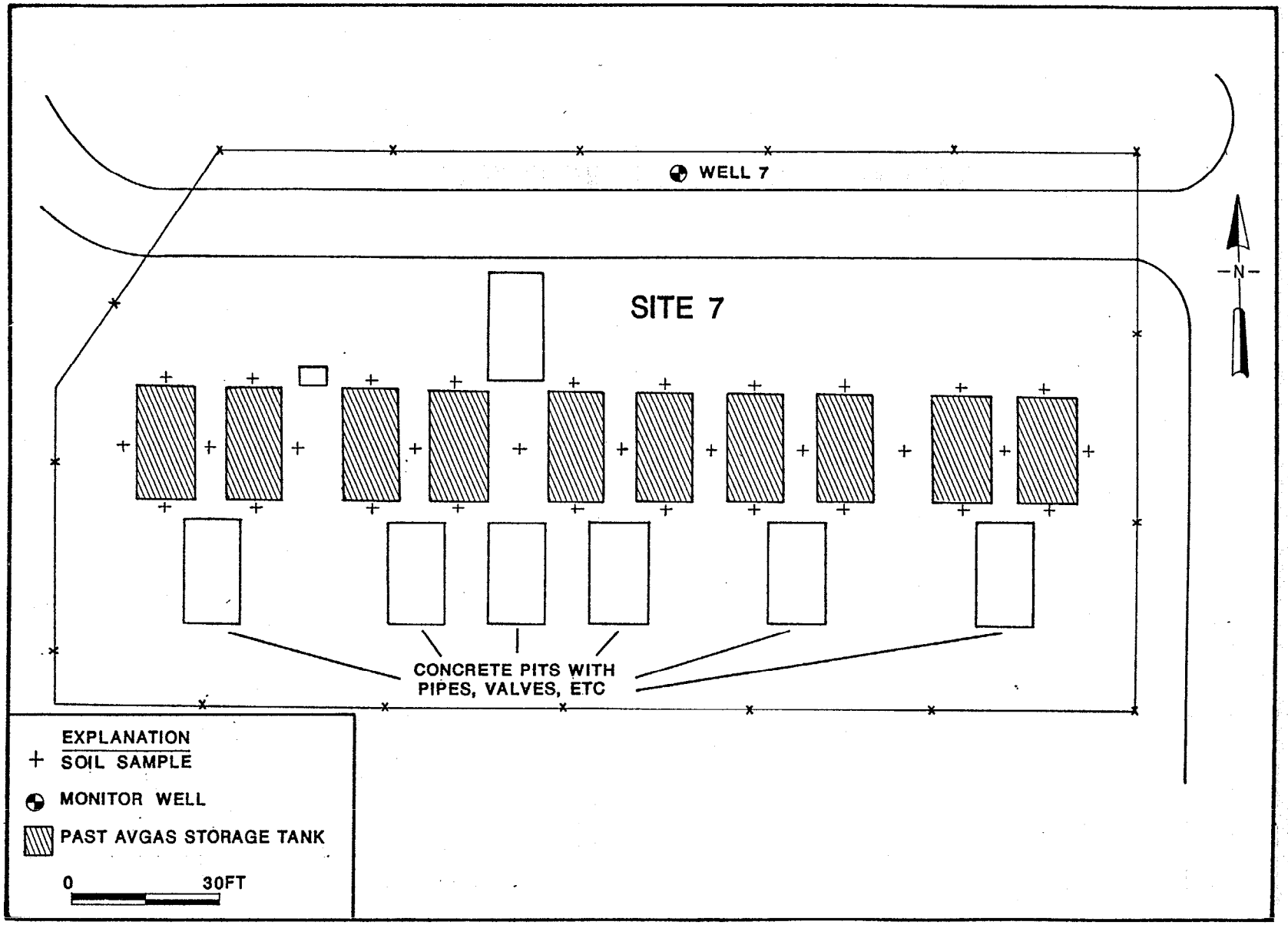


FIGURE 16. Location of South AVGAS Tank Sludge Disposal Area (Site 7).

depth of 142 ft into the upper sand and gravel aquifer; depth to the water-table surface was determined to be 130 ft bls. Ground-water samples were collected and analyzed for BTX, napthalene, EDB, and lead.

The laboratory results of the soil samples (Appendix C) determined concentrations for total lead at 132 and 575 kg/mg; EP toxicity tests of these same soil samples did not detect any lead above the detection limit of 0.01 mg/l (Appendix C).

Analyses of the ground-water sample (Appendix C) collected from monitor well 7 determined high concentrations of benzene (8,800 ug/l), toluene (43,800 ug/l), EDB (23,560 ug/l), and also lead (0.86 mg/l). Benzene, EDB, and lead exceed the state's drinking-water standards.

Based on the chemical analyses, the ground water in the upper part of the sand and gravel aquifer near the south AVGAS tank farm has been impacted by lead and hydrocarbons. Two potential pathways of contaminant flow are considered: (1) to the south via the regional flow in the upper part of the sand and gravel aquifer, and (2) toward the north in the lower (and possibly the upper) part of the sand and gravel aquifer, under the influence of the pumping water-supply well W-S2.

In order to determine the possible direction of contaminant movement in the aquifer, four pairs of monitor

wells should be installed to different depths of ±150 ft and ±225 ft at the locations shown in Figure 17. This will allow the determination of contamination movement from Site 7 in both the upper and lower portions of the sand and gravel aquifer and assist in defining both the vertical and horizontal extent. Three pairs of wells should be installed south, southeast, and southwest of Site 7 in the direction of the regional flow of the ground water. Another pair of proposed wells will be installed mid-way north between Site 7 and supply well W-S2. These wells will determine if contaminants in the aquifer have moved northward under the influence of pumping well W-S2.

Monitor well 7 and the proposed monitor wells will be analyzed for aromatic hydrocarbons (BTX) and EDB according to EPA Methods 601 and 602; dissolved lead will also be analyzed for as an indicator of contaminant movement. Water levels will be measured in all these wells and in water-supply wells W-S2 and W-W3 to establish both horizontal and vertical ground-water gradients in the area.

AVGAS Fuel Spill Area (Site 8)

Background

Site 8 is located south of Building 1406 and adjacent to the helicopter training area at the South Field (Figure 18). High octane aviation fuel (25,000 gallons) was spilled at the South Field in the summer of 1972. The fuel flowed

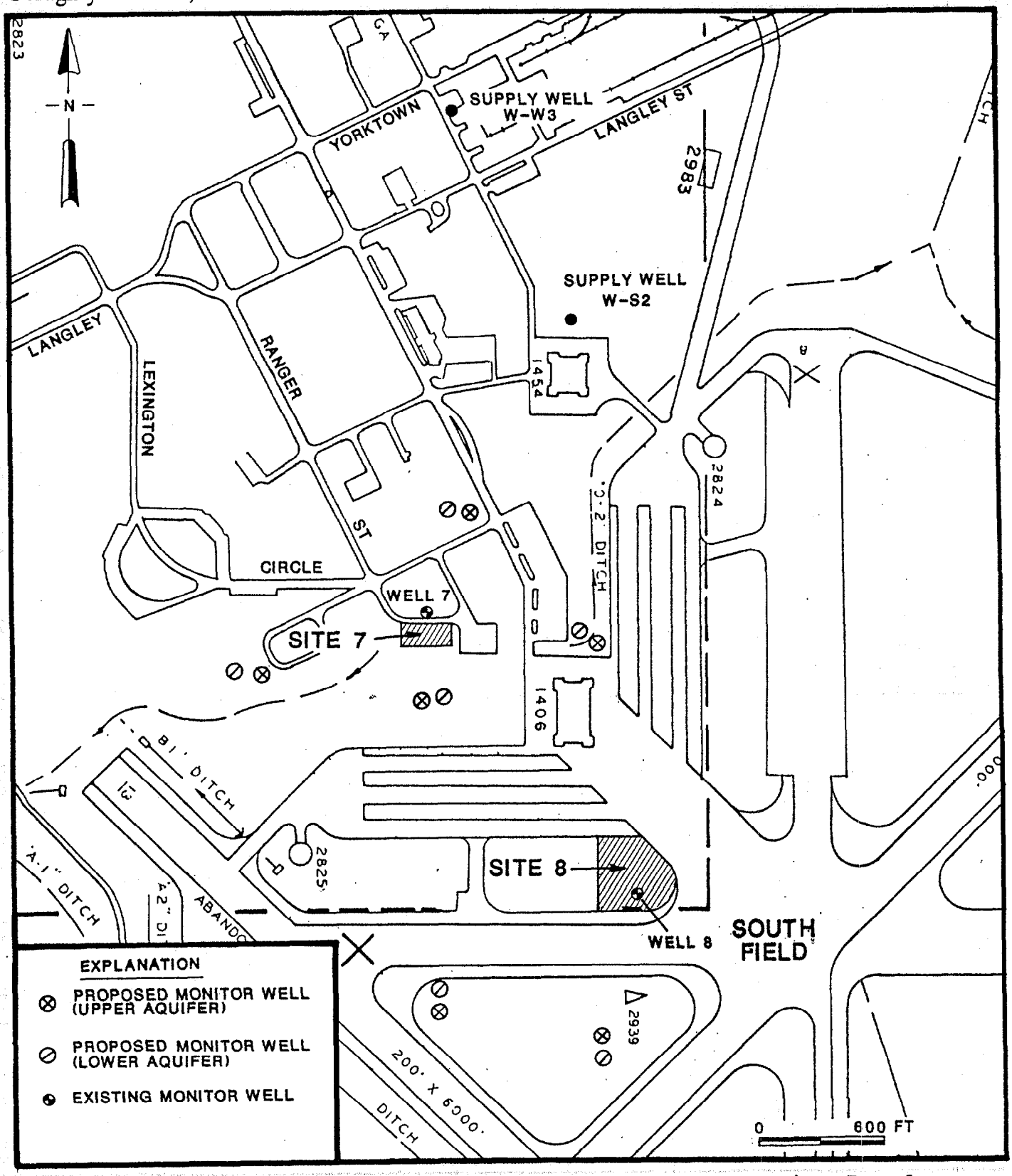


FIGURE 17. Locations of Proposed Monitor Wells for Site 7 and Site 8.

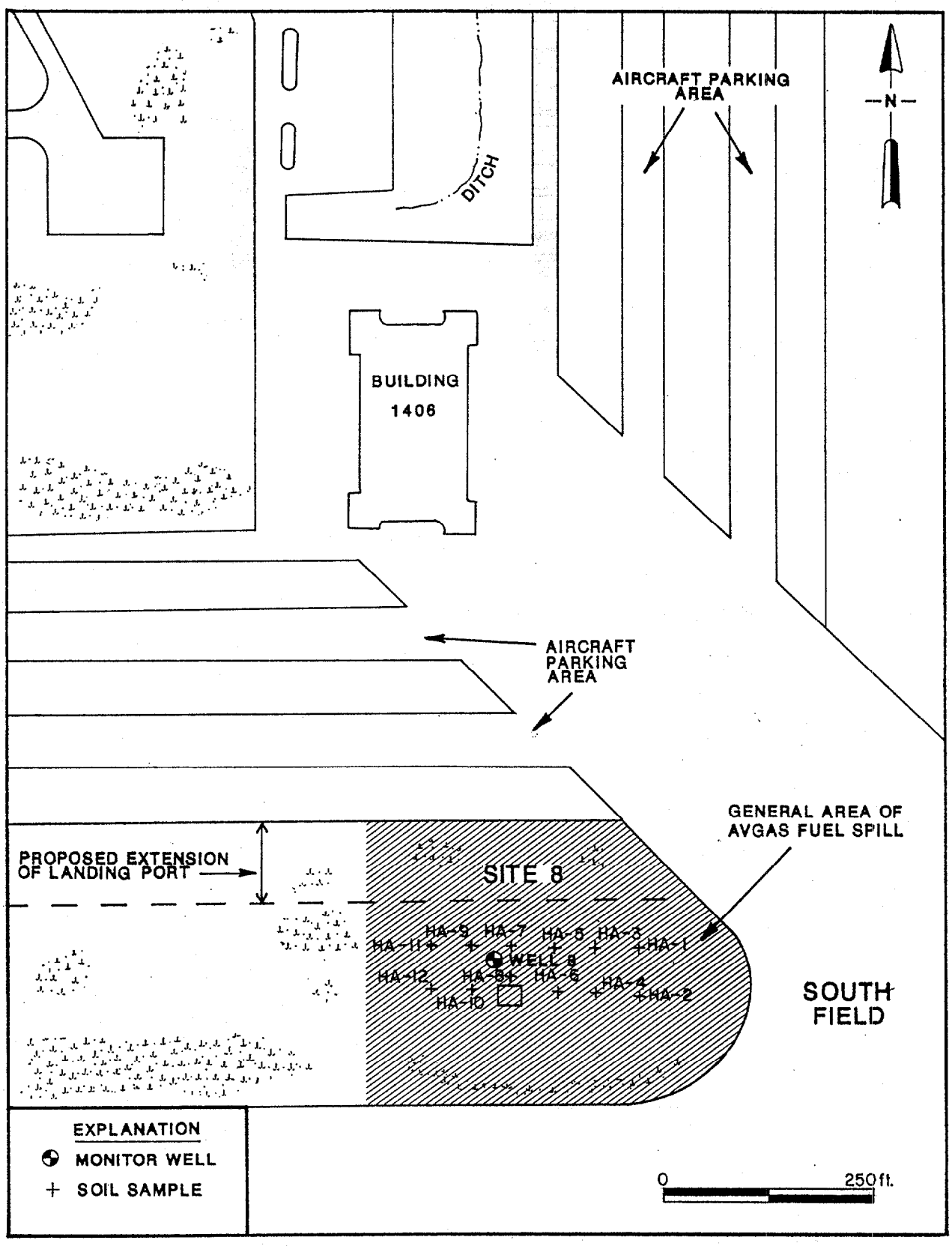


FIGURE 18. Location of AVGAS Fuel Spill Area (Site 8).

approximately 200 ft across a concrete apron and onto a grassed area where it ponded in an area of approximately two acres. During the investigation, it was reported by NAS staff that the adjacent pavement will be extended about 75 ft over the past spill site.

Findings and Recommendations

Soil samples from 12 locations were collected from the uppermost sediments to a depth of 2 ft in an area representing the lowest elevations (Figure 18). At each auger hole location, the soil was composited and analyzed for total lead concentration and EP toxicity for lead. A monitor well, also shown in Figure 18, was installed to a depth of 180 ft and ground-water samples were collected and analyzed for BTX, EDB, and lead.

The laboratory results (Appendix C) for the soil samples taken from Site 8 show concentrations for total lead ranging from 3.1 to 27 mg/kg, but all EP toxicity tests for lead were below the detection limit of 0.01 ppm.

The depth to ground water at Site 8 was found to be about 117 ft bls. The laboratory results (Appendix C) for the ground-water samples from Site 8 show concentrations of benzene at 2 ug/l and toluene at 26 ug/l. Lead and EDB were below the state's drinking-water standards but benzene slightly exceeded the standard of 1 ug/l. Napthalene was below the analytical method detection limit.

Similar to Site 7, two potential pathways for the movement of hydrocarbons from Site 8 in the sand and gravel aquifer are considered: (1) downward movement into the production zone of the aquifer and then north toward supply well W-S2, and (2) lateral ground-water movement to the south in the upper part of the sand and gravel aquifer. To determine if hydrocarbons have moved north from the site, a monitor well immediately to the north of Building 1406 installed for Site 7, will be in the potential ground-water flow path between Site 8 and supply well W-S2. Two pairs of monitor wells (±150 ft and ±200 ft), tapping the upper and lower part of the aquifer, should be installed south of Site 8 in order to determine potential migration of hydrocarbons with respect to the southerly ground-water flow direction at the site. The location of these proposed monitor wells is shown on Figure 17. Similar to Site 7, all proposed and existing monitor wells will be sampled and analyzed for aromatic hydrocarbons (BTX), EDB, and lead.

Waste Fuel Disposal Pit (Site 9)

Background

Site 9 is located along the eastern property line near the South Field (Figure 19). The disposal pit is located in a depressed area of an old borrow pit which is as much as 10 ft lower than the perimeter road. During the 1950's and 1960's, tank trucks transported waste fuel which contained tetraethyl lead for disposal in the northern portion of the

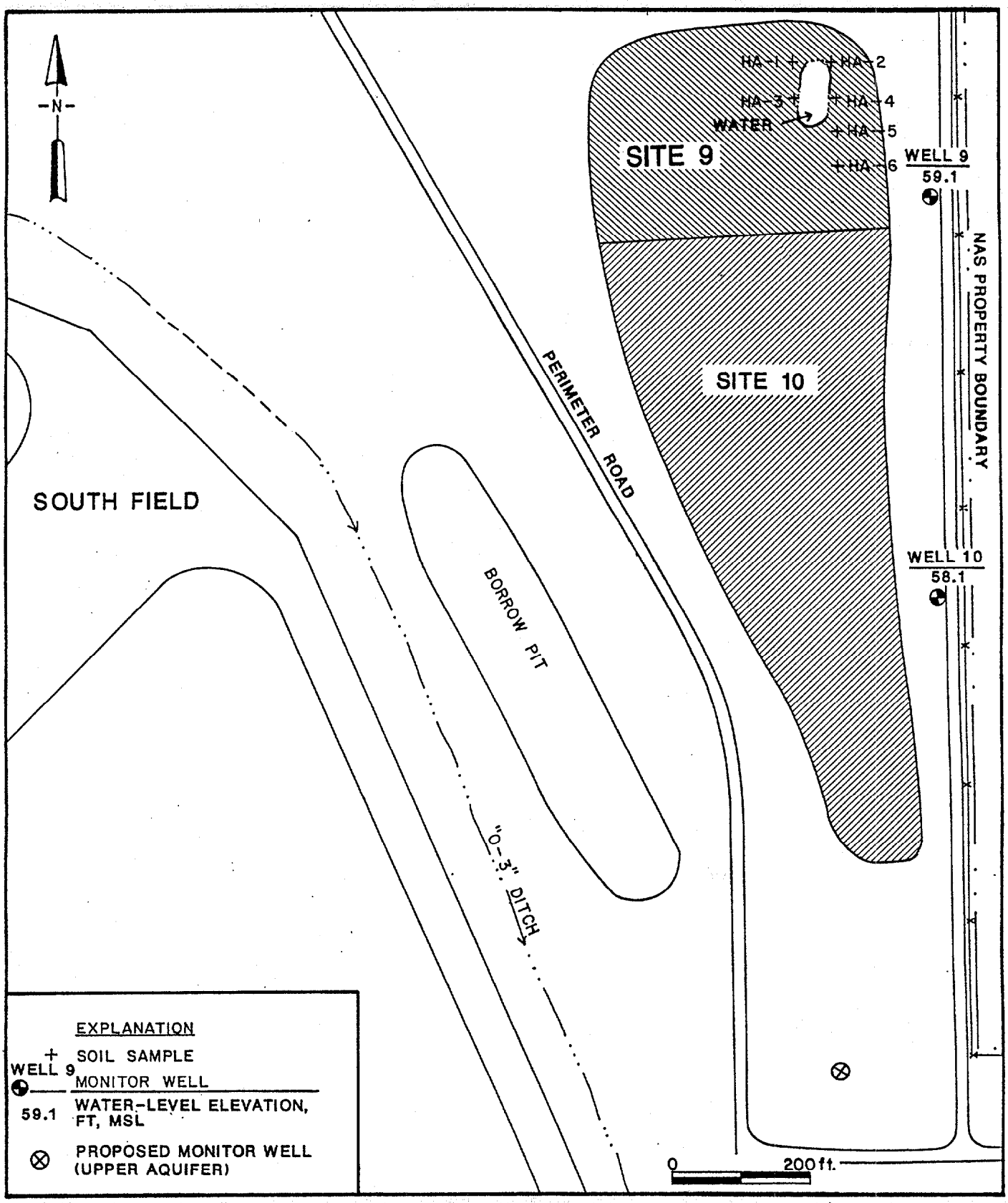


FIGURE 19. Locations of Waste Fuel Disposal Pit (Site 9) and Southeast Open Disposal Area (A) (Site 10).

borrow pit. Surface-water drainage within this area is primarily toward the northeastern corner where it ponds and slowly infiltrates into the soil. Based on a field reconnaisance of the site, it is improbable that surface-water runoff occurs out from the site.

Findings and Recommendations

Soil samples were collected from the six locations shown on Figure 19. Two soil samples were collected from six test holes from the intervals of the surface to 1 ft and from 1 ft to 2 ft. These 12 samples then were analyzed for total lead content and EP toxicity for lead and concentrations of BTX. Also a monitor well to a depth of 117 ft was installed adjacent to the east side of the site where the water-table surface was determined to be about 87 ft bls; ground-water samples were collected for analysis of BTX, EDB, and lead.

The soil samples collected were described in the field as typically sandy clay. Total lead content ranged from 9 mg/kg to 14 mg/kg; however, the results of EP toxicity tests did not detect any lead at a detection limit of 0.01 mg/l (Appendix C).

Analyses of ground-water samples (Appendix C) did not detect any BTX or EDB and a trace concentration of lead was detected well below the FDER's drinking-water standard.

Although residual lead is contained in the soils at the site, apparently due to past waste-disposal practices, it is

judged that there is not a high degree of mobility. Due to its proximity to Site 10, recommendations for further investigation are discussed in the following text of Site 10.

Southeast Open Disposal Area (A) (Site 10)

Background

Site 10 is contiguous to and south of Site 9 and located within the same old borrow pit area (Figure 19). From 1965 to 1973, this four-acre site was used for the disposal of inert wastes such as construction debris, trees, brush, metal cans, and similar materials not suitable for landfill disposal. Transformer oil and empty pesticide/herbicide containers were also reportedly disposed of at the site. Access to the site was uncontrolled and other potentially hazardous wastes may have been disposed of at the site. Based on the field investigation, surface-water runoff out of the site is improbable; drainage within the borrow pit is toward the northeastern corner (Site 9).

Findings and Recommendations

Monitor well 10 was installed to a depth of 117 ft adjacent to the east side of the site; depth to the ground-water table was determined to be 88 ft bls. Water-level elevations in monitor wells 9 and 10 indicate a southerly component of flow across Sites 9 and 10. A water sample from monitor well 10 was analyzed for EPA's list of

priority pollutants, along with some additional pesticide compounds.

No organic constituents were detected in the ground-water sample and very minor concentrations of lead, zinc, and silver were detected at well below the FDER's drinking-water standards. Because monitor well 9 and monitor well 10 are not situated conclusively downgradient from their respective sites, an additional monitor well is proposed to be installed south of both these sites (Figure 19). After completion, this new well will be sampled and analyzed along with existing monitor wells 9 and 10 for EPA's list of priority pollutants to verify or refute whether contaminants have leached from Sites 9 and 10. If no significant concentrations of contaminants are found, no further investigative work will be recommended for these sites.

Southeast Open Disposal Area (B) (Site 11)

Background

Site 11 is located in the southeastern part of the NAS near the eastern property boundary (Figure 20). This three-acre site is an old borrow pit that was used as an open disposal area in 1943 until approximately 1970. The site had uncontrolled access and received a wide variety of wastes, including general refuse, construction debris, tree clippings, furniture, waste solvents, paint, transformer oils, hydraulic fluid, and various other oils.

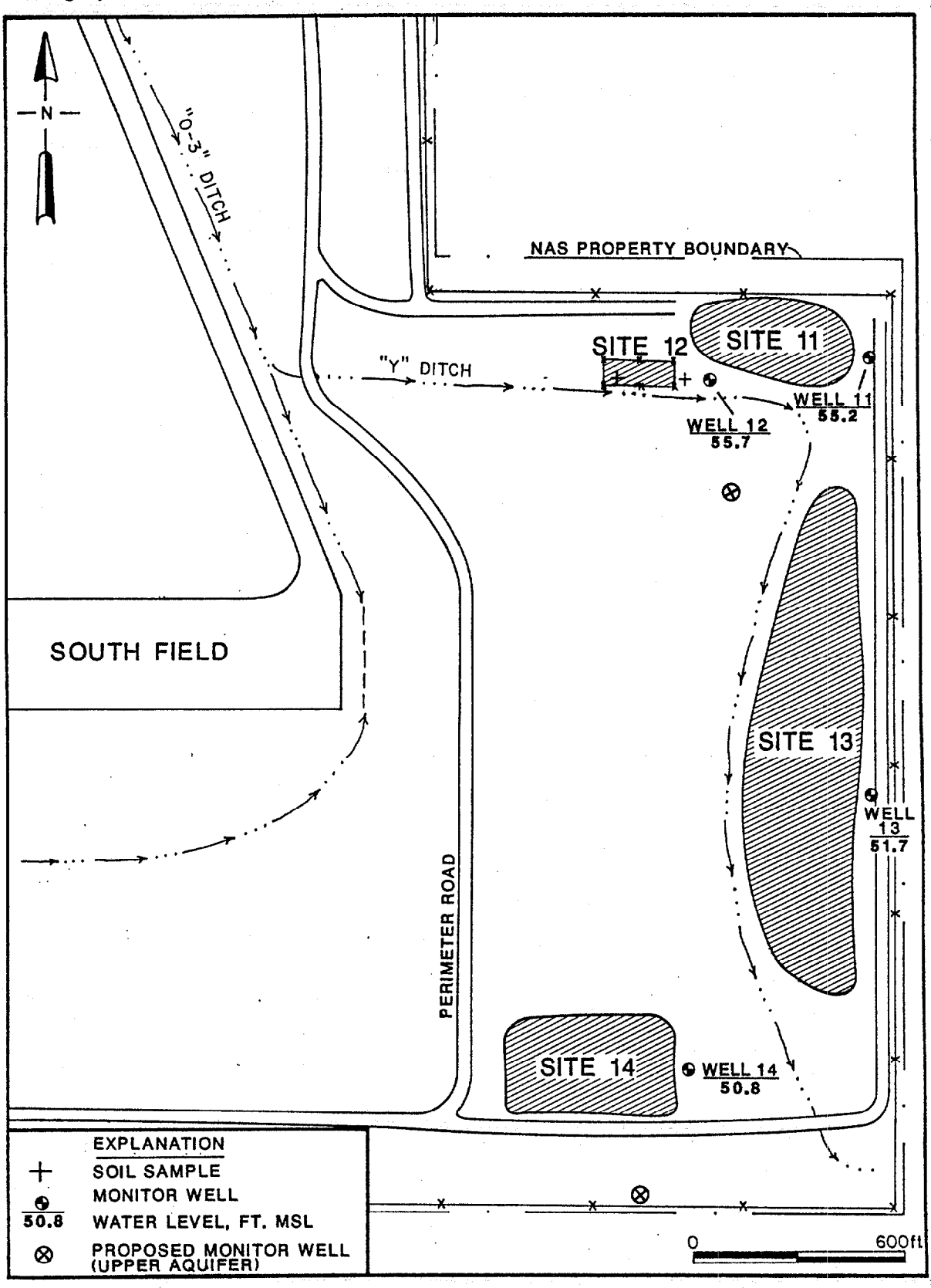


FIGURE 20. Locations of Southeast Open Disposal Area (B) (Site 11), Tetraethyl Lead Disposal Area (Site 12), Sanitary Landfill (Site 13), and Short-Term Sanitary Landfill (Site 14).

When disposal operations were discontinued in 1970, a final covering was placed over the site and pine trees planted. There is a low point in the northeastern corner where surface drainage ponds. Any runoff from the site is in a northeasterly direction toward Big Coldwater Creek, which is approximately 1.7 miles away.

Findings and Recommendations

Monitor well 11 was installed to a depth of 127 ft and on the eastern side of the site at the location shown in Figure 20. Ground-water samples were collected and analyzed for EPA's list of priority pollutants, with additional pesticide compounds.

The water-quality analyses did not detect any organic constituents except bis (2-ethylhexyl) phthalate at 23 ug/l. Only trace concentrations of mercury and zinc, well below the FDER's drinking-water standards, were detected. Because of its proximity to Site 12 and the likelihood for an overall southern ground-water flow in this area, additional action for this site is discussed later in conjunction with Site 12.

Tetraethyl Lead Disposal Area (Site 12)

Background

Site 12 is located in the southeastern part of the base and adjoining Site 11 (Figure 20). Tank bottom sludge from the cleaning of the North and South Field aqua system fuel

storage tanks and fuel filters contaminated with tetraethyl lead were disposed of at Site 12 in May 1968. The disposal area consists of two earth-covered mounds within a fenced area of approximately 50 ft by 25 ft. Each of the mounds is approximately five feet high and ten feet in diameter with reportedly about 200 to 400 gallons of sludge in each mound.

The "Y" drainage ditch, which is not concrete lined, is located immediately adjacent to the southern border of the site, and receives any surface runoff from the area. The drainage ditch ultimately discharges to Big Coldwater Creek, approximately 1.7 miles east of the site.

Findings and Recommendations

Composite soil samples were collected from a depth of 2 ft to 3 ft at the two locations shown in Figure 20. The soils to a depth of 3 ft were described as organic-rich fine sand. These samples were analyzed for total lead concentration and EP toxicity for lead. Monitor well 12, also shown in Figure 20, was installed to a depth of 112 ft; the depth to water was determined to be about 6 ft. A ground-water sample was collected and analyzed for BTX, napthalene, EDB, and lead.

The laboratory results for the soil samples taken from Site 12 show concentrations for total lead ranging from 4 to 11 mg/kg; EP toxicity tests detected no lead above 0.01 mg/l.

The laboratory results of the ground-water sample taken from well 12 show a trace concentration of lead well below the FDER's drinking-water standards. No organic constituents were detected in the ground water adjacent to and underlying the site.

Monitor wells 11 and 12 were installed to the east of their respective sites, under the preconception that the primary direction of ground-water flow in this area was east toward Big Coldwater Creek. Although the water levels shown in Figure 20 indicate a head difference of 0.5 ft to the east, the overall regional flow in the vicinity of the site appears to have a component of flow to the south-southeast. Therefore, it is recommended that an additional monitor well be installed south and midway between the sites at the location shown in Figure 20. This well will be installed to a depth of ±120 ft and will be sampled along with monitor wells 11 and 12 for EPA's list of priority pollutants. If no contaminants are detected upon re-analysis, then no further investigation of Sites 11 and 12 will be conducted.

Sanitary Landfill (Site 13)

Background

Site 13 is located on the eastern property line of the South Field (Figure 20). This four-acre site is the currently operating sanitary landfill for NAS Whiting Field. During the first year (1979) of operation, waste solvents and

residue from paint-stripping operations may have been disposed of at the site. Since then the landfill has received only general refuse and non-hazardous waste.

Findings and Recommendations

Monitor well 13 was installed to a depth of 112 ft at the location shown in Figure 20; depth to ground water at the site is about 51 ft bls. A ground-water sample was collected and analyzed for EPA's list of priority pollutants, including VOCs, acid and base/neutral extractable organic compounds, pesticides, herbicides, PCBs, and metals.

No organic constituents were detected in the ground water; minor concentrations of lead, mercury, and zinc were all below FDER's drinking-water standards and nickel occurred at a low concentration of 0.06 mg/l. Recommendations for Site 13 are discussed in the following text of Site 14.

Short-Term Sanitary Landfill (Site 14)

Background

Site 14 is also located in the southeastern part of the South Field and close to Site 13 (Figure 20). This 2.5-acre site was used as a sanitary landfill for six to nine months starting in 1978. The wastes disposed of at the site would have been general and non-hazardous refuse, although waste solvents and residue from paint-stripping operations may have been disposed of in the past.

The site was abandoned because of excessive clay content in the soil. This caused water to pond throughout the site. Surface drainage from the area is in an easterly direction toward the vegetated "Y" ditch, which borders the site on the east. The ditch drains east toward Big Coldwater Creek, which is located approximately 1.8 miles east of the site.

Findings and Recommendations

Monitor well 14 was installed to a depth of 152 ft along the east side of the site (Figure 20); depth to ground water is about 90 ft. A ground-water sample was collected and analyzed for EPA's list of priority pollutants, including VOCs, acid and base/neutral extractable organic compounds, pesticides, herbicides, PCBs, and metals.

No organic contaminants were detected in monitor well 14; however, trace concentrations of lead and zinc were detected well below the FDER's drinking-water standards.

Similar to the above-mentioned discussion of Sites 11 and 12, monitor wells 13 and 14 were also located east of their respective sites with the preconception that ground-water flow in this area was primarily east. Based on the ground-water elevations shown in Figure 20, there appears to be a more southerly component of flow in the area. Therefore, to ascertain the absence or presence of potential contaminants from Sites 13 and 14 in the ground-water system, it is recommended that one additional monitor well be

installed south of and hydraulically downgradient of both sites as shown in Figure 20. The anticipated depth of this well will be ±130 ft bls. This well and existing monitor wells 13 and 14 will be sampled and analyzed for EPA's list of priority pollutants.

Southwest Landfill (Site 15)

Background

This 15-acre site located near the wastewater treatment plant was operated as a landfill from 1965 until 1979, during which time it received the majority of wastes generated at NAS Whiting Field. Wastes disposed of at this site included primarily general refuse, paint, paint thinner, solvents, waste oil, hydraulic fluid, and possibly transformer oil. Approximtely 3,000 to 4,500 tons of waste were disposed of at the site annually.

The site is at the foot of the western highland and slopes at about 5 percent from east to west toward Clear Creek, which is approximately 1,200 ft west of the site. Much of the site is covered with small pine trees. However, there are numerous areas void of vegetation and there has been severe surface erosion at the site resulting in the exposure of some buried wastes.

Findings and Recommendations

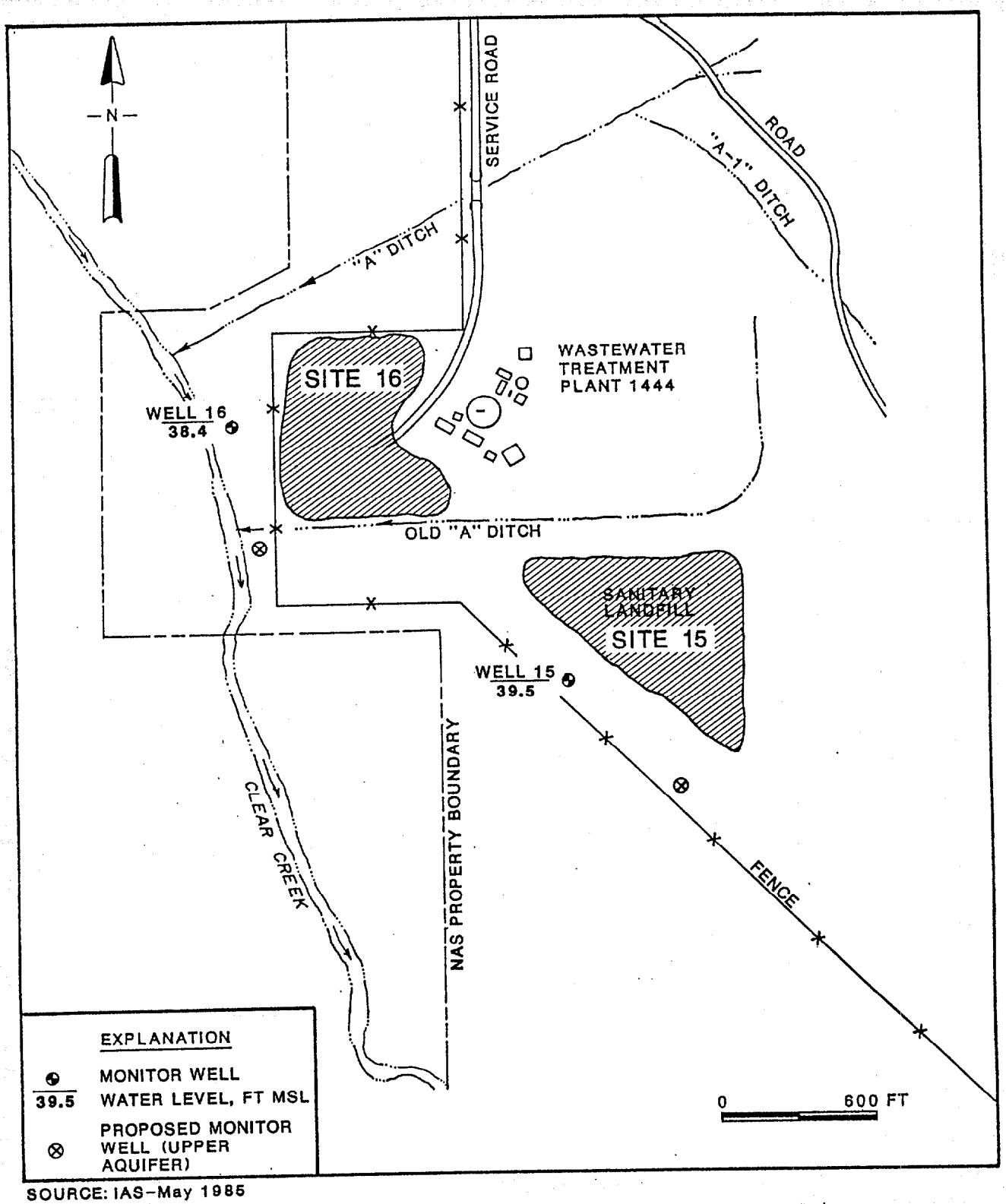
Monitor well 15 was installed to a depth of 72 ft along the west side of the site (Figure 21); depth to the ground-water table is about 27 ft and based on the water-level elevations, direction of flow is west toward Clear Creek. A ground-water sample was collected and analyzed for EPA's list of priority pollutants, including VOCs, acid and base/neutral extractable organic compounds, pesticides, herbicides, PCBs, and metals.

The only organic compound detected in the water sample from well 15 was bis (2-ethylhexyl) phthalate at 118 ug/l. Trace concentrations of lead and zinc were detected well below the FDER's drinking-water standards. Although the presence of this compound does not appear to be significant, additional investigation for this site is discussed along with Site 16 in the following text.

Open Disposal and Burning Area (Site 16)

Background

This ten-acre site is west of and adjoins the wastewater treatment plant and was used as an open disposal and burning area from 1943 until around 1965. The site reportedly received the majority of wastes, which consisted primarily of general refuse, generated at the air station. However, waste oil, paint, solvents, hydraulic fluid, and transformer oil also may have been disposed of at the site. Approximately



SOURCE: IAS-May 1985

FIGURE 21. Locations of Southwest Landfill (Site 15) and Open Disposal and Burning Area (Site 16).

3,000 to 4,500 tons of waste were disposed of here annually, the majority of which was burned for volume reduction using waste diesel fuel. Surface-water runoff from the site is west to Clear Creek, which is located approximately 200 ft from the site.

Findings and Recommendations

Monitor well 16, located to the west of Site 16, was installed to a depth of 42 ft (Figure 21); depth to the ground-water table was determined to be about 11 ft. A ground-water sample was collected and analyzed for EPA's list of priority pollutants, including VOCs, acid and base/neutral extractable organic compounds, pesticides, herbicides, PCBs, and metals.

The laboratory analysis of the ground-water sample collected from well 16 showed a concentration of bis (2-ethylhexyl) phthalate at 36 ug/l; trace amounts of lead and zinc were also detected well below the FDER's drinking-water standards.

Monitor wells 15 and 16 appear to be located downgradient of their respective waste-disposal sites. Furthermore, out of the entire list of priority pollutants analyzed for, only one organic compound of questionable significance was detected (see discussion of Sites 17 and 18). However, because of the large areas that Sites 15 and 16 cover and the relatively long distance the downgradient

side (west-southwest) represents, it is recommended that two more wells be installed at the locations shown in Figure 21. Because of the variety of wastes and the uncertainty of their types, these wells will be sampled and analyzed for EPA's list of priority pollutants; existing monitor wells 15 and 16 will be sampled and analyzed only for base/neutral extractable compounds (EPA Method 625).

SUMMARY OF PROPOSED WORK

Several of the sites investigated in the Verification Study have been inactive for a number of years, and since that time, contaminants have been attenuated by processes such as evaporation, biochemical and biological degradation, and adsorption. Of the 16 sites investigated during this study, 15 are recommended for additional study in the Characterization Phase, some of which consist only of resampling and analysis of water samples from existing monitor wells to conclusively demonstrate that no impact to the underlying ground water has occurred. The proposed work during characterization is summarized in Table 4.

At selected sites, additional monitor wells have been proposed to determine direction, rate of movement, and the areal extent of contaminant plumes. These monitor wells have been strategically located to monitor both the upper and lower parts of the sand and gravel aquifer to delineate contaminant movement towards points of discharge such as surface-water features and cones of depressions that have been created by the active production wells.

Table 4. Summary of Proposed Work for Characterization Study at NAS Whiting Field.

Site/Number	Proposed Monitor Wells	Chemical Analyses: Ground-Water Samples	Chemical Analyses: Surface-Water Samples	Other
Northwest Disposal Area (Site 1)	-	1; VOCs & Metals	1; VOCs & Metals	
Crash Crew Training Areas (Sites 17 & 18)	1	3; Base-neutral extractable organic compounds, BTX, Fluoride, surfactants		
Underground Waste Solvent Storage Area (Site 3)	3	5; VOCs & PCBs		3 water-level recorders
North AVGAS Tank Sludge Disposal Area (Site 4)	5	6; BTX		
South AVGAS Tank Sludge Disposal Area (Site 7)	8	9; BTX, EDB & Pb		
AVGAS Fuel Spill Area (Site 8)	4	5; BTX, EDB & Pb		
Waste Fuel Disposal Pit (Site 9) and Southeast Open Disposal Area (A) (Site 10)	1	3; EPA Priority Pollutants		
Southeast Open Disposal Area (B) (Site 11) and Tetraethyl Lead Disposal Area (Site 12)	1	3; EPA Priority Pollutants		
Sanitary Landfill (Site 13) and Short-Term Sanitary Landfill (Site 14)	1	3; EPA Priority Pollutants		
Southwest Landfill (Site 15) and Open Disposal and Burning Area (Site 16)	2	2; EPA Priority Pollutants 2; Base/Neutral Extractable Organic Compounds		

APPENDIX A

Lithologic Logs of Monitor Wells and Drillers Logs of Water-Supply Wells, NAS Whiting Field

361(2)6

LITHOLOGIC LOG FOR WELL NUMBER (SITE 1)

Description	Depth (ft)	Thickness (ft)
Sand, fine to coarse, grained, buff; gravel; organics (0-5').....	0 - 85.0	85.0
Sand, fine to coarse grained, buff; gravel.....	85.0 - 95.0	10.0
Clay, buff, brown, tan; sand, fine to coarse grained, buff; gravel.....	95.0 - 108.0	13.0
Sand, fine to coarse grained, buff; gravel.....	108.0 - 120.0	12.0
Clay, yellow, buff, brown; sand, fine to coarse grained, buff.....	120.0 - 125.0	5.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 17)

Description	Depth (ft)	Thickness (ft)
Clay, red; sand, fine to medium grained; some small cobbles, gray black.....	0 - 35.0	35.0
Clay, light gray; sand, fine grained.....	35.0 - 85.0	50.0
Sand, fine to coarse grained, buff; gravel.....	85.0 - 152.0	67.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 18)

Description	Depth (ft)	Thickness (ft)
Sand, fine to medium grained, red; clay, red; gravel.....	0 - 20.0	20.0
Sand, fine to coarse grained, buff; gravel.....	20.0 - 78.0	58.0
Clay, interbedded with sand, red, white and buff.....	78.0 - 80.0	2.0
Sand, fine to coarse grained, buff; gravel.....	80.0 - 122.0	42.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 3 EAST)

Description	Depth (ft)	Thickness (ft)
Clay, red; sand, fine to medium grained....	0 - 22.0	22.0
Sand, fine to coarse grained, buff; clay, gray.....	22.0 - 45.0	23.0
Sand, fine to coarse grained, buff.....	45.0 - 110.0	65.0
Clay, gray; sand, very fine grained.....	110.0 - 130.0	20.0
Sand, fine to coarse grained, buff; gravel.....	130.0 - 152.0	22.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 3-SOIL BORING)

Description	Depth (ft)	Thickness (ft)
Clay, red; sand, fine to medium grained....	0 - 20.0	20.0
Sand, fine to medium grained, white.....	20.0 - 25.0	5.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 3 WEST)

Description	Depth (ft)	Thickness (ft)
Clay, red; sand, fine to medium grained....	0 - 20.0	20.0
Sand, fine to coarse grained, buff; clay, gray.....	20.0 - 45.0	25.0
Sand, fine to coarse grained, buff.....	45.0 - 102.0	57.0
Clay, gray; sand, very fine grained.....	102.0 - 122.0	20.0
Sand, fine to coarse grained, buff; gravel.....	122.0 - 152.0	30.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 4)

Description	Depth (ft)	Thickness (ft)
Clay, red; sand, fine to medium grained; gravel.....	0 - 30.0	30.0
Sand, fine to coarse grained, buff; gravel.....	30.0 - 98.0	68.0
Clay, gray; sand fine to medium grained...	98.0 - 119.0	21.0
Sand, fine to coarse grained, buff; gravel.....	119.0 - 152.0	33.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 7)

Description	Depth (ft)	Thickness (ft)
Clay, red; sand, fine to medium grained; @ 10' large black rock (limonite).....	0 - 24.0	24.0
Sand, fine to coarse grained, buff; gravel.....	140.0 - 148.0	8.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 8)

Description	Depth (ft)	Thickness (ft)
Clay, red; sand, fine to medium grained...	0 - 35.0	35.0
Sand, fine to medium grained, buff; clay streaks.....	35.0 - 110.0	75.0
Sand, fine to coares grained buff; gravel.	110.0 - 118.0	8.0
Clay, light gray; sand, fine to coarse grained, streaks.....	118.0 - 128.0	10.0
Sand, fine to coarse grained white; gravel.....	128.0 - 138.0	10.0
Sand, fine to coarse grained, white; clay, light gray, streaks.....	138.0 - 180.0	42.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 9)

Description	Depth (ft)	Thickness (ft)
Clay, red, brown; sand, fine to medium grained, red, brown.....	0 - 15.0	15.0
Clay, red, white; sand, fine to medium grained, white, streaks.....	15.0 - 50.0	35.0
Sand, fine to medium grained, white; clay red, white, streaks.....	50.0 - 75.0	25.0
Clay, red, white.....	75.0 - 90.0	15.0
Sand, fine to coarse grained, white; gravel; streaks of clay.....	90.0 - 116.0	26.0
Clay, red, white.....	116.0 - 120.0	4.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 10)

Description	Depth (ft)	Thickness (ft)
Clay, red, white, yellow, light gray; sand, fine to medium grained.....	0 - 40.0	40.0
Sand, fine to coarse grained, white; clay, red, white, streaks.....	40.0 - 75.0	35.0
Clay, red, white, gray.....	75.0 - 98.0	23.0
Sand, fine to coarse grained, white; clay, red, white, streaks.....	98.0 - 117.0	19.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 11)

Description	Depth (ft)	Thickness (ft)
Clay, red, gray; sand, fine to medium grained	0 - 36.0	36.0
Clay, red, blue gray, light gray, orange yellow, white	36.0 - 72.0	36.0
Sand, fine to coarse grained white; clay streaks	72.0 - 100.0	28.0
Sand, fine to medium grained, white; clay streaks	100.0 - 115.0	15.0
Sand, fine to coarse grained, white; gravel, few mafics	115.0 - 127.0	12.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 12)

Description	Depth (ft)	Thickness (ft)
Clay, brown, red; sand, fine to medium grained	0 - 26.0	26.0
Sand, fine to coarse grained, white; clay, red, white, streaks	26.0 - 55.0	29.0
Clay, red, white, light gray; sand, fine to coarse grained, white, streaks	55.0 - 95.0	40.0
Sand, fine to coarse grained, white; gravel; clay, red, white, streaks	95.0 - 112.0	17.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 13)

Description	Depth (ft)	Thickness (ft)
Clay, red, gray; sand, fine to medium grained.....	0 - 50.0	50.0
Clay, light gray; sand, fine grained, buff.	50.0 - 78.0	28.0
Sand, fine to coarse grained, buff.....	78.0 - 80.0	2.0
Clay, light gray.....	80.0 - 105.0	25.0
Sand, fine to coarse grained, buff; gravel, some mafics; clay, light gray, streaks.....	105.0 - 124.0	19.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 14)

Description	Depth (ft)	Thickness (ft)
Clay, red, gray; sand, fine to medium grained.....	0 - 50.0	50.0
Sand, fine to coarse grained, buff.....	50.0 - 75.0	25.0
Sand, fine to medium grained, buff; clay, streaks, orange, yellow, light gray.....	75.0 - 90.0	15.0
Clay, light gray; sand, fine grained, buff.	90.0 - 125.0	35.0
Sand, fine to coarse grained, buff; gravel some mafics.....	125.0 - 152.0	27.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 15)

Description	Depth (ft)	Thickness (ft)
Clay, red, gray, tan; sand, fine to medium grained.....	0 - 42.0	42.0
Sand, fine to coarse grained, buff; clay, light gray.....	42.0 - 65.0	23.0
Sand, fine to coarse grained, buff; gravel, mafics.....	65.0 - 72.0	7.0

LITHOLOGIC LOG FOR WELL NUMBER (SITE 16)

Description	Depth (ft)	Thickness (ft)
Sand, fine to medium grained, yellow; clay, yellow.....	0 - 9.0	9.0
Clay, red, white.....	9.0 - 15.0	6.0
Sand, fine to coarse grianed, white; gravel.....	15.0 - 42.0	27.0

DRILLERS LOG OF NAS OLD NORTH SUPPLY WELL

Well designation: W-N2
Surface Elevation: 168.1 ft msl

Depth (ft)	Description	Elevation (ft msl)
0 - 30	Sandy clay	168 - 138
30 - 44	Loose muddy sand and gravel	138 - 124
44 - 66	White sand with clay streaks	124 - 102
66 - 89	White sand with clay balls	102 - 79
89 - 102	Muddy sand	79 - 66
102 - 113	Clay	66 - 55
113 - 135	Yellow sandy clay	55 - 33
135 - 140	Clay	33 - 28
140 - 140.4	Rock	28 - 27.6
140.4 - 156	Muddy Sand	27.6 - 12
156 - 183	Pack sand, clay streaks	12 - (-15)
183 - 200	Brown pack sand with loose streaks	(-15) - (-32)
200 - 237	Sandy clay	(-32) - (-69)
237 - 254	Soft yellow clay	(-69) - (-86)
254 - 275	Muddy sand	(-86) - (-107)
275 - 304	Pack sand	(-107) - (-136)
304 - 312	Sandy shale	(-136) - (-144)
312 - 365	Hard sandy shale	(-144) - (-197)
365 - 424	Clay	(-197) - (-256)

DRILLERS LOG OF NAS TEST WELL

Well designation: W-N3
Surface elevation: 171.5 ft msl

Depth (ft)	Description	Elevation (ft msl)
0 - 2	Topsoil	171 - 169
2 - 9	Sandy	169 - 162
9 - 22	Red clay to yellow chalk	162 - 149
22 - 27	Yellow sand, clay streaks	149 - 144
27 - 39	Clay	144 - 132
39 - 42	Coarse sand, clay stringers	132 - 129
42 - 52	Coarse sand, clay stringers, loose	129 - 119
52 - 62	Coarse sand, clay stringers, tight	119 - 109
62 - 75	Sand, cut well	109 - 96
75 - 80	Sand, tight	96 - 91
80 - 90	Sand, loose	91 - 81
90 - 100	Sand	81 - 71
100 - 119	Yellow clay	71 - 52
119 - 125	Sand	52 - 46
125 - 137	Muddy sand	46 - 34
137 - 145	Sand, cut well	34 - 26
145 - 165	Sand	26 - 6
165 - 176	Sand, small clay strings	6 - (-5)
176 - 198	Sand; iron minerals at 23-27 ft	(-5) - (-27)
198 - 217	Muddy sand	(-27) - (-46)
217 - 222	Black chalk	(-46) - (-51)
222 - 229	Sandy, bad looking	(-51) - (-58)

DRILLERS LOG OF NAS NORTH SUPPLY WELL

Well designation: W-N4
Surface elevation: 180 ft msl

Depth (ft)	Description	Elevation (ft msl)
0 - 15	Sandy clay	180 - 165
15 - 25	Pink chalk	165 - 155
25 - 40	Fine muddy sand	155 - 140
40 - 50	Muddy sand	140 - 130
50 - 54	Clay	130 - 126
54 - 65	Muddy sand	126 - 115
65 - 85	Fine muddy sand	115 - 95
85 - 90	Fine packed sand	95 - 90
90 - 114	Clay	90 - 66
114 - 125	Muddy sand	66 - 55
125 - 137	Fine packed sand	55 - 43
137 - 157	Muddy sand with mud balls	43 - 23
157 - 167	Sand (coarse good) some gravel	23 - 13
167 - 177	Sand (good)	13 - 3
177 - 195	Sand	3 - (-15)
195 - 203	Sand (red)	(-15) - (-23)
203 - 210	Sand	(-23) - (-30)
210 - 218	Clay and mud	(-30) - (-38)

DRILLERS LOG OF NAS ABANDONED WEST WELL

Well designation: W-W2
Surface elevation: 197.6 ft msl

Depth (ft)	Description	Elevation (ft msl)
0 - 9	Sand	198 - 189
9 - 22	Clay	189 - 176
22 - 32	Muddy sand	176 - 166
32 - 35	Clay	166 - 163
35 - 74	Sandy clay	163 - 124
74 - 124	Coarse pack sand	124 - 74
124 - 120	Soft yellow muddy sand	74 - 70
120 - 158	Sandy clay	70 - 40
158 - 178	Coarse pack sand	40 - 20
178 - 199	Coarse to fine pack sand	20 - (-1)
199 - 221	Coarse pack sand	(-1) - (-23)
221 - 244	Pack sand, streak	(-23) - (-46)
244 - 245	Rock	(-46) - (-47)
245 - 260	Soft sand and clay	(-47) - (-62)
260 - 270	Pack sand	(-62) - (-52)
270 - 294	Hard fine sand	(-52) - (-96)
294 - 355	Hard and soft blue sandy shale	(-96) - (-157)

DRILLERS LOG OF NAS WEST SUPPLY WELL

Well designation: W-W3
Surface elevation: 180 ft msl

Depth (ft)	Description	Elevation (ft msl)
0 - 23	Red sandy clay	180 - 157
23 - 50	Fine sand and white clay	157 - 130
50 - 73	Sand and white clay balls	130 - 107
73 - 76	Sand and gravel	107 - 104
76 - 88	Fine sand	104 - 92
88 - 90	Fine sand and clay	92 - 90
90 - 105	Medium sand	90 - 75
105 - 113	Loose medium sand	75 - 67
113 - 132	Pink and yellow clay	67 - 48
132 - 150	Medium sand	48 - 30
150 - 153	Loose sand	30 - 27
153 - 156	Yellow clay	27 - 24
156 - 165	Loose sand	24 - 15
165 - 175	Medium sand	15 - 5
175 - 195	Sand and gravel	5 - (-15)
195 - 215	Loose sand and gravel	(-15) - (-35)
215 - 220	Yellow clay and iron rock	(-35) - (-40)

DRILLERS LOG OF NAS SOUTH SUPPLY WELL

Well designation: W-S2
Surface elevation: 181.5 ft msl

Depth (ft)	Description	Elevation (ft msl)
0 - 27	Red sandy clay	181 - 154
27 - 66	Sand and clay balls	154 - 115
66 - 88	Sand	115 - 93
88 - 110	Pack sand	93 - 71
110 - 121	Sand and clay balls	71 - 60
121 - 133	Fine pack sand	60 - 48
133 - 146	Pack sand	48 - 35
146 - 148	Clay	35 - 33
148 - 155	Loose sand and gravel	33 - 26
155 - 173	Soft sandy clay	26 - 8
173 - 197	Pack sand and soft streaks	8 - (-16)
197 - 215	Pack sand	(-16) - (-34)
215 - 245	Yellow clay	(-34) - (-64)
245 - 251	Rock	(-64) - (-70)
251 - 255	Clay	(-70) - (-74)
255 - 273	Red sandy clay	(-74) - (-92)
273 - 340	Sandy shale	(-92) - (-159)

LITHOLOGIC LOG OF USGS DEEP MONITOR WELL.

Well designation: USGS
Surface elevation: 125.0 ft msl

Lithology	Thickness (feet)	Depth (feet)
Clay, white to brown, sticky; sand, white to clear quartz, medium.	20	20
Sand, clear to white quartz, medium; clay, brown to red.	20	40
Sand, clear to white, medium to coarse; gravel, white to yellow, very coarse to pea size; clay, brown.	20	60
Sand, clear to white, medium to coarse, sub-rounded to rounded; gravel, clear to white, very coarse; clay, light brown.	90	150
Clay, yellow to brown, sticky; gravel, very coarse to small pebbles; sand, medium, clear to white.	10	160
Sand, clear to white, medium to coarse, sub-rounded to angular; gravel--very coarse to pebble; clay, light brown.	50	210
Clay, green-gray to red, sticky; gravel, very coarse to pea size; sand, clear to white medium.	10	220
Sand, white to clear, medium to coarse; gravel, white to clear, very coarse to pebbles; clay, yellow brown to green, sticky.	30	250

APPENDIX B

pH and Specific Conductance Measurements of Water Samples, NAS Whiting Field

Table B-1. Field Parameters of Water Samples from NAS Whiting Field

SITE NUMBER	TEMPERATURE °C (a)	pH	SPECIFIC CONDUCTANCE uhmos/cm
1	21°	7.7	<50
CLEAR CREEK	21°	6.7	<50
17	21°	7.3	<50
18	21°	7.3	140
3E	21°	8.6	<50
3W	21°	8.7	<50
4	21°	7.4	<50
7	21°	6.3	295
8	21°	7.4	175
9	22°	8.9	200
10	21°	8.7	315
11	22°	8.1	190
12	22°	7.4	650
13	22°	9.6	340
14	22°	10.2	<50
15	22°	9.9	50
16	22°	8.2	<50

(a) = temperature of water measured at land surface
umhos/cm = micromhos per centimeter
< = less than

APPENDIX C

Chemical Analyses
of Soil and Water
NAS Whiting Field, Florida

SITE 1

Northwest Disposal Area

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 325
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, Florida 33618

Lab I.D. 86-1855
NAS Whiting Field Project
T0290WHI

CLEAR CREEK

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Collector:	Bob Baker	
Sample Site:	Clear Creek/Site 1	
Date and Time Collected:	June 11, 1986	12:30 p.m.
Date and Time Samples Received:	June 11, 1986	3:15 p.m.
Analysts:	Bernie Fuson	
Date Analyses Started:		
Date Reported:	July 18, 1986	
Laboratory I.D. No.:	81142	

Approved By: Paul Canevari

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, FL 33618

Lab I.D. #86-1855
Sample I.D.: Clear Creek Site 1
Date of Order: 6/11/86

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 Norh Dale Mabry Highway
Tampa, FL 33618

Lab I.D.: 86-1855
Sample I.D. Clear Creek
Site 1 NAS Whiting Field
Project T0290WHI

PRIORITY POLLUTANT ANALYSIS*

ACID EXTRACTABLES

		Reported in ppb	Detection Limit (ppb)
1A	2-Chlorophenol	BDL	15
2A	2,4-Dichlorophenol	BDL	10
3A	2,4-Dimethylphenol	BDL	5
4A	4,6-Dinitro-o-Cresol	BDL	50
5A	2,4-Dinitrophenol	BDL	30
6A	2-Nitrophenol	BDL	10
7A	4-Nitrophenol	BDL	20
8A	p-Chloro-m-Cresol	BDL	25
9A	Pentachlorophenol	BDL	30
10A	Phenol	BDL	5
11A	2,4,6-Trichlorophenol	BDL	20

*EPA Method 604 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600 4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D.: 86-1855
Sample Site: Clear Creek
Site 1 NAS Whiting Field
Project T0290WHI

PRIORITY POLLUTANT ANALYSIS*

BASE NEUTRAL EXTRACTABLES

		Reported in ppb	Detection Limit ppb
1	Acenaphthene	BDL	10
2B	Acenaphthylene	BDL	10
3B	Anthracene	BDL	10
4	Benzidine	BDL	10
5B	Benzo(a)anthracene	BDL	10
6B	Benzo(a)pyrene	BDL	10
7	3,4-Benzofluoranthene	BDL	10
8	Benzo(ghi)perylene	BDL	10
9B	Benzo(k)fluoranthane	BDL	10
10B	Bis(2-chloroethoxy)methane	BDL	10
11B	Bis(2-chloroethyl)ether	BDL	10
12B	Bis(2-chloroisopropyl)ether	BDL	10
13B	Bis(2-ethylhexyl)phthalate	BDL	10
14B	4-Bromophenyl Phenyl Ether	BDL	10
15B	Butylbenzyl Phthalate	BDL	10
16B	2-Chloronaphthalene	BDL	10
17B	4-Chlorophenyl Phenyl Other	BDL	10
18B	Chrysene	BDL	10
19B	Dibenzo(a,h)anthracene	BDL	25
20B	1,2-Dichlorobenzene	BDL	10
21B	1,3-Dichlorobenzene	BDL	10
22B	1,4-Dichlorobenzene	BDL	10
23B	3,3-Dichlorobenzidine	BDL	10
24B	Diethylphthalate	BDL	10
25B	Dimethylphthalate	BDL	10
26B	Di-n-Butyl Phthalate	BDL	10
27B	2,4-Dinitrotoluene	BDL	10
28B	2,6-Dintrotoluene	BDL	10
29B	Di-n-Octyl-Phthalate	BDL	10
30B	1,2-Diphenylhydrazine	BDL	10
31B	Fluoranthene	BDL	10
32B	Fluorene	BDL	10
33B	Hexachlorobenzene	BDL	10
34B	Hexachlorobutadiene	BDL	10
35B	Hexachlorocyclopentadiene	BDL	10
36B	Hexachloroethane	BDL	10
37B	Indeno(1,2,3-cd)pyrene	BDL	10
38B	Isophorone	BDL	10
39B	Naphthalene	BDL	10
40B	Nitrobenzene	BDL	10
41B	N-Nitrosodimethylamine	BDL	10
42B	N-Nitrosodi-n-propylamine	BDL	10
43B	N-Nitrosodiphenylamine	BDL	10
44B	Phenanthrene	BDL	10
45B	Pyrene	BDL	10
46B	1,2,4-Trichlorobenzene	BDL	10

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limit

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Gearghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1855
Sample I.D.: Clear Creek
Site 1 NAS Whiting Field
Project T0290WHI

PRIORITY POLLUTANT ANALYSIS*

PESTICIDES

		Reported in ppb	Detection Limit (ppb)
1P	Malathion	BDL	1
2P	Aldrin	BDL	0.01
3P	a-BHC	BDL	0.01
4P	b-BHC	BDL	0.01
5P	g-BHC	BDL	0.01
6P	d-BHC	BDL	0.01
7P	Chlorodane	BDL	0.01
8P	4,4'-DDT	BDL	0.01
9P	4,4'-DDE	BDL	0.01
10P	4,4'-DDD	BDL	0.01
11P	Dieldrin	BDL	0.01
12P	a-Endosulfan I	BDL	0.01
13P	b-Endosulfan II	BDL	0.01
14P	Endosulfan Sulfate	BDL	0.01
15P	Endrin	BDL	0.01
16P	Endrin Aldehyde	BDL	0.07
17P	Heptachlor	BDL	0.03
18P	Heptachlor Epoxide	BDL	0.01
19P	PCB-1242	BDL	0.01
20P	PCB-1254	BDL	0.2
21P	PCB-1221	BDL	0.2
22P	PCB-1232	BDL	0.2
23P	PCB-1248	BDL	0.2
24P	PCB-1260	BDL	0.2
25P	PCB-1016	BDL	0.2
26P	Toxaphene	BDL	1
27P	Kepone	BDL	0.35

Herbicides:

1	2,4-D	BDL	2
2	2,4,5-TP Silvex	BDL	20

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1855
Date: June 11, 1986
Sample I.D. Clear Creek Site 1
NAS Whiting Field Project # TO290WHI

Priority Pollutant Analysis

Priority Pollutant Compound		Sample Identification Priority Pollutant Concentration	
Metals, Cyanide and Phenols		ppm	ppb
1M	Antimony	<0.05	<50
2M	Arsenic	<0.001	<1
3M	Beryllium	<0.01	<10
4M	Cadmium	<0.0001	<0.1
5M	Chromium	<0.01	<10
6M	Copper	<0.01	<10
7M	Lead	0.001	1
8M	Mercury	<0.0001	<0.1
9M	Nickel	<0.05	<50
10M	Selenium	<0.001	<1
11M	Silver	<0.0001	<0.1
12M	Thallium	<0.1	<100
13M	Zinc	<0.01	<10
14	Cyanide	<0.005	<5
15	Phenols	<0.001	<1

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, Florida 33618

Lab I.D. 86-1831-1

MONITOR WELL 1

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Collector:	Bob Baker
Sample Site:	Site 1 9:20 a.m.
Date and Time Collected:	June 10, 1986
Date and Time Samples Received:	June 10, 1986
Analysts:	Bernie Fuson
Date Analyses Started:	
Date Reported:	July 18, 1986
Laboratory I.D. No.:	81142

Approved By: Paul Canonico

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, FL 33618

Lab I.D. #86-1831-1
Sample I.D.: Site 1
Date of Order: 6/10/86

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D.: 86-1831-1
Date of Order: June 10, 1986
Sample I.D.: Site 1
NAS Whiting Field Project T0290WH

PRIORITY POLLUTANT ANALYSIS*

ACID EXTRACTABLES

		Reported in ppb	Detection Limit (ppb)
1A	2-Chlorophenol	BDL	15
2A	2,4-Dichlorophenol	BDL	10
3A	2,4-Dimethylphenol	BDL	5
4A	4,6-Dinitro-o-Cresol	BDL	50
5A	2,4-Dinitrophenol	BDL	30
6A	2-Nitrophenol	BDL	10
7A	4-Nitrophenol	BDL	20
8A	p-Chloro-m-Cresol	BDL	25
9A	Pentachlorophenol	BDL	30
10A	Phenol	BDL	5
11A	2,4,6-Trichlorophenol	BDL	20

*EPA Method 604 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600 4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D.: 86-1831-1
Date of Order: June 10, 1986
Sample I.D.: Site 1
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

BASE NEUTRAL EXTRACTABLES

		Reported in ppb	Detection Limit ppb			Reported in ppb	Det Limi ppb
1B	Acenaphthene	BDL	10	24B	Diethylphthalate	BDL	10
2B	Acenaphthylene	BDL	10	25B	Dimethylphthalate	BDL	10
3B	Anthracene	BDL	10	26B	Di-n-Butyl Phthalate	BDL	10
4B	Benzidine	BDL	10	27B	2,4-Dinitrotoluene	BDL	10
5B	Benzo(a)anthracene	BDL	10	28B	2,6-Dintrotoluene	BDL	10
6B	Benzo(a)pyrene	BDL	10	29B	Di-n-Octyl-Phthalate	BDL	10
7B	3,4-Benzofluoranthene	BDL	10	30B	1,2-Diphenylhydrazine	BDL	10
8B	Benzo(ghi)perylene	BDL	10	31B	Fluoranthene	BDL	10
9B	Benzo(k)fluoranthane	BDL	10	32B	Fluorene	BDL	10
10B	Bis(2-chloroethoxy)methane	BDL	10	33B	Hexachlorobenzene	BDL	10
11B	Bis(2-chloroethyl)ether	BDL	10	34B	Hexachlorobutadiene	BDL	10
12B	Bis(2-chloroisopropyl)ether	BDL	10	35B	Hexachlorocyclopentadiene	BDL	10
13B	Bis(2-ethylhexyl)phthalate	BDL	10	36B	Hexachloroethane	BDL	10
14B	4-Bromophenyl Phenyl Ether	BDL	10	37B	Indeno(1,2,3-cd)pyrene	BDL	10
15B	Butylbenzyl Phthalate	BDL	10	38B	Isophorone	BDL	10
16B	2-Chloronaphthalene	BDL	10	39B	Naphthalene	BDL	10
17B	4-Chlorophenyl Phenyl Other	BDL	10	40B	Nitrobenzene	BDL	10
18B	Chrysene	BDL	10	41B	N-Nitrosodimethylamine	BDL	10
19B	Dibenzo(a,h)anthracene	BDL	25	42B	N-Nitrosodi-n-propylamine	BDL	10
20B	1,2-Dichlorobenzene	BDL	10	43B	N-Nitrosodiphenylamine	BDL	10
21B	1,3-Dichlorobenzene	BDL	10	44B	Phenanthrene	BDL	10
22B	1,4-Dichlorobenzene	BDL	10	45B	Pyrene	BDL	10
23B	3,3-Dichlorobenzidine	BDL	10	46B	1,2,4-Trichlorobenzene	BDL	10

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limit

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1831-1
Date: June 10, 1986
Sample I.D.: Site 1
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

PESTICIDES

		Reported in ppb	Detection Limit (ppb)
1P	Aldrin	BDL	0.01
2P	a-BHC	BDL	0.01
3P	b-BHC	BDL	0.01
4P	g-BHC	BDL	0.01
5P	d-BHC	BDL	0.01
6P	Chlorodane	BDL	0.01
7P	4,4'-DDT	BDL	0.01
8P	4,4'-DDE	BDL	0.01
9P	4,4'-DDD	BDL	0.01
10P	Dieldrin	BDL	0.01
11P	a-Endosulfan I	BDL	0.01
12P	b-Endosulfan II	BDL	0.01
13P	Endosulfan Sulfate	BDL	0.01
14P	Endrin	BDL	0.07
15P	Endrin Aldehyde	BDL	0.03
16P	Heptachlor	BDL	0.01
17P	Heptachlor Epoxide	BDL	0.01
18P	PCB-1242	BDL	0.2
19P	PCB-1254	BDL	0.2
20P	PCB-1221	BDL	0.2
21P	PCB-1232	BDL	0.2
22P	PCB-1248	BDL	0.2
23P	PCB-1260	BDL	0.2
24P	PCB-1016	BDL	0.2
25P	Toxaphene	BDL	1
26P	Kepone	BDL	0.35
27P	Malathion	BDL	1

Herbicides:

1	2,4,-D	BDL	2
2	2,4,5-TP Silvex	BDL	20

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

D: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1831-1
Date: June 10, 1986
Sample I.D. Site 1
NAS Whiting Field Project #
T0290WHI

Priority Pollutant Analysis

Priority Pollutant Compound		Sample Identification Priority Pollutant Concentration	
Metals, Cyanide and Phenols		ppm	ppb
1M	Antimony	<0.05	<50
2M	Arsenic	<0.001	<1
3M	Beryllium	<0.001	<1
4M	Cadmium	<0.0001	<0.1
5M	Chromium	<0.01	<10
6M	Copper	<0.01	<10
7M	Lead	0.008	8
8M	Mercury	<0.0001	<0.1
9M	Nickel	<0.05	<50
10M	Selenium	<0.001	<1
11M	Silver	<0.0001	<0.1
12M	Thallium	<0.1	<100
13M	Zinc	<0.01	<10
14	Cyanide	<0.005	<5
15	Phenols	<0.001	<1

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: W. F. Bowman

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Site 17 and 18

Crash Crew Training Areas

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, Florida 33618

Lab I.D. 86-1831-2
NAS Whiting Field Project #
TO29OWHI

MONITOR WELL 17

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Collector:	Bob Baker
Sample Site:	Site 17 10:15 a.m.
Date and Time Collected:	June 10, 1986
Date and Time Samples Received:	June 10, 1986
Analysts:	Bernie Fuson
Date Analyses Started:	
Date Reported:	July 18, 1986
Laboratory I.D. No.:	81142

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, FL 33618

Lab I.D. #86-1831-2
Sample I.D.: Site 17
Date of Order: 6/10/86

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D.: 86-1831-2
Date of Order: June 10, 1986
Sample I.D.: Site 17
NAS Whiting Field Project T0290W

PRIORITY POLLUTANT ANALYSIS*

ACID EXTRACTABLES

		Reported in ppb	Detection Limit (ppb)
1A	2-Chlorophenol	BDL	15
2A	2,4-Dichlorophenol	BDL	10
3A	2,4-Dimethylphenol	BDL	5
4A	4,6-Dinitro-o-Cresol	BDL	50
5A	2,4-Dinitrophenol	BDL	30
6A	2-Nitrophenol	BDL	10
7A	4-Nitrophenol	BDL	20
8A	p-Chloro-m-Cresol	BDL	25
9A	Pentachlorophenol	BDL	30
10A	Phenol	BDL	5
11A	2,4,6-Trichlorophenol	BDL	20

*EPA Method 604 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600 4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D.: 86-1831-2
Date of Order: June 10, 1986
Sample I.D.: Site 17
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

BASE NEUTRAL EXTRACTABLES

		Reported in ppb	Detection Limit ppb			Reported in ppb	Det. Limit ppb
1	Acenaphthene	BDL	10	24B	Diethylphthalate	BDL	10
2B	Acenaphthylene	BDL	10	25B	Dimethylphthalate	BDL	10
3	Anthracene	BDL	10	26B	Di-n-Butyl Phthalate	BDL	10
4	Benzidine	BDL	10	27B	2,4-Dinitrotoluene	BDL	10
5B	Benzo(a)anthracene	BDL	10	28B	2,6-Dintrotoluene	BDL	10
6B	Benzo(a)pyrene	BDL	10	29B	Di-n-Octyl-Phthalate	BDL	10
7	4-Benzofluoranthene	BDL	10	30B	1,2-Diphenylhydrazine	BDL	10
8B	Benzo(ghi)perylene	BDL	10	31B	Fluoranthene	BDL	10
9B	Benzo(k)fluoranthane	BDL	10	32B	Fluorene	BDL	10
1 B	Bis(2-chloroethoxy)methane	BDL	10	33B	Hexachlorobenzene	BDL	10
1 B	Bis(2-chloroethyl)ether	BDL	10	34B	Hexachlorobutadiene	BDL	10
12B	Bis(2-chloroisopropyl)ether	BDL	10	35B	Hexachlorocyclopentadiene	BDL	10
1 B	Bis(2-ethylhexyl)phthalate	18	10	36B	Hexachloroethane	BDL	10
1 B	4-Bromophenyl Phenyl Ether	BDL	10	37B	Indeno(1,2,3-cd)pyrene	BDL	10
15B	Butylbenzyl Phthalate	BDL	10	38B	Isophorone	BDL	10
16B	2-Chloronaphthalene	BDL	10	39B	Naphthalene	BDL	10
1 B	4-Chlorophenyl Phenyl Other	BDL	10	40B	Nitrobenzene	BDL	10
18B	Chrysene	BDL	10	41B	N-Nitrosodimethylamine	BDL	10
19B	Dibenzo(a,h)anthracene	BDL	25	42B	N-Nitrosodi-n-propylamine	BDL	10
2 B	1,2-Dichlorobenzene	BDL	10	43B	N-Nitrosodiphenylamine	BDL	10
2 B	1,3-Dichlorobenzene	BDL	10	44B	Phenanthrene	BDL	10
22B	1,4-Dichlorobenzene	BDL	10	45B	Pyrene	BDL	10
2 B	3,3-Dichlorobenzidine	BDL	10	46B	1,2,4-Trichlorobenzene	BDL	10

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limit

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1831-2
Date: June 10, 1986
Sample I.D.: Site 17
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

PESTICIDES

		Reported in ppb	Detection Limit (ppb)
1P	Aldrin	BDL	0.01
2P	a-BHC	BDL	0.01
3P	b-BHC	BDL	0.01
4P	g-BHC	BDL	0.01
5P	d-BHC	BDL	0.01
6P	Chlorodane	BDL	0.01
7P	4,4'-DDT	BDL	0.01
8P	4,4'-DDE	BDL	0.01
9P	4,4'-DDD	BDL	0.01
10P	Dieldrin	BDL	0.01
11P	a-Endosulfan I	BDL	0.01
12P	b-Endosulfan II	BDL	0.01
13P	Endosulfan Sulfate	BDL	0.01
14P	Endrin	BDL	0.07
15P	Endrin Aldehyde	BDL	0.03
16P	Heptachlor	BDL	0.01
17P	Heptachlor Epoxide	BDL	0.01
18P	PCB-1242	BDL	0.2
19P	PCB-1254	BDL	0.2
20P	PCB-1221	BDL	0.2
21P	PCB-1232	BDL	0.2
22P	PCB-1248	BDL	0.2
23P	PCB-1260	BDL	0.2
24P	PCB-1016	BDL	0.2
25P	Toxaphene	BDL	1
26P	Kepone	BDL	0.35
27P	Malathion	BDL	1

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1831-2
Date: June 10, 1986
Sample I.D. Site 17
NAS Whiting Field Project #
TO29OWHI

Priority Pollutant Analysis

Priority Pollutant Compound		Sample Identification Priority Pollutant Concentration	
Metals, Cyanide and Phenols		ppm	ppb
1M	Antimony	<0.05	<50
2M	Arsenic	<0.001	<1
3M	Beryllium	<0.001	<1
4M	Cadmium	<0.0001	<0.1
5M	Chromium	<0.01	<10
6M	Copper	<0.01	<10
7M	Lead	0.012	12
8M	Mercury	0.0005	0.5
9M	Nickel	<0.05	<50
10M	Selenium	<0.001	<1
11M	Silver	<0.0001	<0.1
12M	Thallium	<0.1	<100
13M	Zinc	<0.01	<10
14	Cyanide	<0.005	<5
15	Phenols	<0.001	<1

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: W. F. Bowen

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, Florida 33618

Lab I.D. 86-1831-3
NAS Whiting Field Project #
TO29OWHI

MONITOR WELL 18

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Collector:	Bob Baker	
Sample Site:	Site 18	8:25 a.m.
Date and Time Collected:	June 10, 1986	
Date and Time Samples Received:	June 10, 1986	
Analysts:	Bernie Fuson	
Date Analyses Started:		
Date Reported:	July 18, 1986	
Laboratory I.D. No.:	81142	

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FLO94 • FDER # ELO2O

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D.: 86-1831-3
Date of Order: June 10, 1986
Sample I.D.: Site 18
NAS Whiting Field Project T0290W

PRIORITY POLLUTANT ANALYSIS*

ACID EXTRACTABLES

		Reported in ppb	Detection Limit (ppb)
1A	2-Chlorophenol	BDL	15
2A	2,4-Dichlorophenol	BDL	10
3A	2,4-Dimethylphenol	BDL	5
4A	4,6-Dinitro-o-Cresol	BDL	50
5A	2,4-Dinitrophenol	BDL	30
6A	2-Nitrophenol	BDL	10
7A	4-Nitrophenol	BDL	20
8A	p-Chloro-m-Cresol	BDL	25
9A	Pentachlorophenol	BDL	30
10A	Phenol	BDL	5
11A	2,4,6-Trichlorophenol	BDL	20

*EPA Method 604 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600 4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D.: 86-1831-3
Date of Order: June 10, 1986
Sample I.D.: Site 18
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

BASE NEUTRAL EXTRACTABLES

		Reported in ppb	Detection Limit ppb
B	Acenaphthene	BDL	10
2B	Acenaphthylene	BDL	10
3B	Anthracene	BDL	10
B	Benzidine	BDL	10
B	Benzo(a)anthracene	BDL	10
6B	Benzo(a)pyrene	BDL	10
B	3,4-Benzofluoranthene	BDL	10
I	Benzo(ghi)perylene	BDL	10
9B	Benzo(k)fluoranthane	BDL	10
10B	Bis(2-chloroethoxy)methane	BDL	10
1B	Bis(2-chloroethyl)ether	BDL	10
12B	Bis(2-chloroisopropyl)ether	BDL	10
13B	Bis(2-ethylhexyl)phthalate	32	10
4B	4-Bromophenyl Phenyl Ether	BDL	10
5B	Butylbenzyl Phthalate	BDL	10
16B	2-Chloronaphthalene	BDL	10
7B	4-Chlorophenyl Phenyl Other	BDL	10
8B	Chrysene	BDL	10
19B	Dibenzo(a,h)anthracene	BDL	25
20B	1,2-Dichlorobenzene	BDL	10
1B	1,3-Dichlorobenzene	BDL	10
22B	1,4-Dichlorobenzene	BDL	10
23B	3,3-Dichlorobenzidine	BDL	10
24B	Diethylphthalate	BDL	10
25B	Dimethylphthalate	BDL	10
26B	Di-n-Butyl Phthalate	BDL	10
27B	2,4-Dinitrotoluene	BDL	10
28B	2,6-Dintrotoluene	BDL	10
29B	Di-n-Octyl-Phthalate	BDL	10
30B	1,2-Diphenylhydrazine	BDL	10
31B	Fluoranthene	BDL	10
32B	Fluorene	BDL	10
33B	Hexachlorobenzene	BDL	10
34B	Hexachlorobutadiene	BDL	10
35B	Hexachlorocyclopentadiene	BDL	10
36B	Hexachloroethane	BDL	10
37B	Indeno(1,2,3-cd)pyrene	BDL	10
38B	Isophorone	BDL	10
39B	Naphthalene	BDL	10
40B	Nitrobenzene	BDL	10
41B	N-Nitrosodimethylamine	BDL	10
42B	N-Nitrosodi-n-propylamine	BDL	10
43B	N-Nitrosodiphenylamine	BDL	10
44B	Phenanthrene	BDL	10
45B	Pyrene	BDL	10
46B	1,2,4-Trichlorobenzene	BDL	10

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limit

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1831-3
Date: June 10, 1986
Sample I.D.: Site 18
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

PESTICIDES

		Reported in ppb	Detection Limit (ppb)
1P	Aldrin	BDL	0.01
2P	a-BHC	BDL	0.01
3P	b-BHC	BDL	0.01
4P	g-BHC	BDL	0.01
5P	d-BHC	BDL	0.01
6P	Chlorodane	BDL	0.01
7P	4,4'-DDT	BDL	0.01
8P	4,4'-DDE	BDL	0.01
9P	4,4'-DDD	BDL	0.01
10P	Dieldrin	BDL	0.01
11P	a-Endosulfan I	BDL	0.01
12P	b-Endosulfan II	BDL	0.01
13P	Endosulfan Sulfate	BDL	0.01
14P	Endrin	BDL	0.07
15P	Endrin Aldehyde	BDL	0.03
16P	Heptachlor	BDL	0.01
17P	Heptachlor Epoxide	BDL	0.01
18P	PCB-1242	BDL	0.2
19P	PCB-1254	BDL	0.2
20P	PCB-1221	BDL	0.2
21P	PCB-1232	BDL	0.2
22P	PCB-1248	BDL	0.2
23P	PCB-1260	BDL	0.2
24P	PCB-1016	BDL	0.2
25P	Toxaphene	BDL	1
26P	Kepone	BDL	0.35
27P	Malathion	BDL	1

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, FL 33618

Lab I.D. #86-1831-3
Sample I.D.: Site 18
Date of Order: 6/10/86

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1831-3
Date: June 10, 1986
Sample I.D. Site 18
NAS Whiting Field Project #
TO29OWHI

Priority Pollutant Analysis

Priority Pollutant Compound		Sample Identification Priority Pollutant Concentration	
Metals, Cyanide and Phenols		ppm	ppb
1M	Antimony	<0.05	<50
2M	Arsenic	<0.001	<1
3M	Beryllium	<0.001	<1
4M	Cadmium	<0.0001	<0.1
5M	Chromium	<0.01	<10
6M	Copper	<0.01	<10
7M	Lead	0.023	23
8M	Mercury	0.0006	0.6
9M	Nickel	<0.05	<50
10M	Selenium	<0.001	<1
11M	Silver	<0.0001	<0.1
12M	Thallium	<0.1	<100
13M	Zinc	<0.01	<10
14	Cyanide	<0.005	<5
15	Phenols	<0.001	<1

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

SITE 3

Underground Waste Solvent Storage Area

Pioneer
LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, Florida 33618

Lab I.D. 86-1829-1
Water Samples
NAS Whiting Field Project #
TO29OWHI

MONITOR WELL 3E

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Collector:	Bob Baker	
Sample Site:	3 E	
Date and Time Collected:	June 10, 1986	12:00 p.m.
Date and Time Samples Received:	June 10, 1986	4:00 p.m.
Analysts:	Bernie Fuson	
Date Analyses Started:		
Date Reported:	July 18, 1986	
Laboratory I.D. No.:	81142	

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, FL 33618

Lab I.D. #86-1829-1
Sample I.D.: 3 E
Date of Order: 6/10/86
Water Samples
NAS Whiting Field Project #
TO290WHI

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, FL 33618

Lab I.D.: 86-1829-1
Date of Order: June 10, 1986
Sample I.D.: 3 E
Water Samples
NAS Whiting Field Project # TO290WHI

Analysis	Results
Benzene, ppb	<1
Xylene, ppb	<5
Toluene, ppb	<1
MIBK, ppb	<10
Phenols, ppm	<0.001
Chromium, ppm	<0.01
Cadmium, ppm	<0.0001
Lead, ppm	0.005
Zinc, ppm	<0.01
Arsenic, ppm	0.001
Barium, ppm	<0.1
Mercury, ppm	<0.0001
Selenium, Se, ppm	<0.001
Silver, ppm	<0.0001

Note: ppb = parts per billion
ppm = parts per million
< = less than

Approved By: W. F. Bowden

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, Florida 33618

Lab I.D. 86-1829-2
Water Samples
NAS Whiting Field Project #
T0290WHI

MONITOR WELL 3W

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Collector:	Bob Baker	
Sample Site:	3 W	
Date and Time Collected:	June 10, 1986	12:45 p.m.
Date and Time Samples Received:	June 10, 1986	4:00 p.m.
Analysts:	Bernie Fuson	
Date Analyses Started:		
Date Reported:	July 18, 1986	
Laboratory I.D. No.:	81142	

Approved By: W. F. Bowen

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, FL 33618

Lab I.D. #86-1829-2
Sample I.D.: 3 W
Date of Order: 6/10/86
Water Samples
NAS Whiting Field Project #
TO290WHI

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	13	5
28V	1,1,2-Trichloroethane	111	5
29V	Trichloroethylene	18	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Malbry Highway
Tampa, FL 33618

Lab I.D.: 86-1829-2
Date of Order: June 10, 1986
Sample I.D.: 3 W
Water Samples
NAS Whiting Field Project # TO290WHI

Analysis	Results
Benzene, ppb	<1
Xylene, ppb	<5
Toluene, ppb	<1
MIBK, ppb	<10
Phenols, ppm	<0.001
Chromium, ppm	<0.01
Cadmium, ppm	<0.0001
Lead, ppm	0.012
Zinc, ppm	<0.01
Arsenic, ppm	<0.001
Barium, ppm	<0.1
Mercury, ppm	<0.0001
Selenium, Se, ppm	<0.001
Silver, ppm	<0.0001

Note: ppb = parts per billion
ppm = parts per million
< = less than

Approved By: W. F. Bowen

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller

Lab I.D.: 86-1503-1

SOIL SAMPLES

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Client: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Collector: Bob Baker (Bocskowsky)

Sample Site: Soil ST3 0'

Date and Time Collected: May 13, 1986 1:30 pm

Date and Time Samples Received: May 13, 1986 4:00 pm

Analysts: Bernie Fuson

Date Analyses Started: **Date Analyses Completed:**

Date Reported: June 23, 1986

Laboratory I.D. No.: 81142

Approved By: Paul Canevaro

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1503-1
Date of Order: 5/13/86
Sample I.D.: Soil ST3 0'

Analysis	Results
Total Lead, ppm	<1
Arsenic, ppm	<0.01
Barium, ppm	<5
Selenium, ppm	<0.1
Silver, ppm	0.92
Chromium, ppm	43
Cadmium, ppm	0.28
Zinc, ppm	586
Mercury, ppm	0.20
Total Solids, %	89.9%
Phenols, ppm	0.61

Note: Results reported in ppm = mg/kg on dry basis.

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1503-1
Sample I.D.: Soil ST3 O'
Date of Order: May 13, 198

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppm	Detection Limit (ppm)
1V	Acrolein	BDL	3.0
2V	Acrylonitrile	BDL	3.0
3V	Benzene	BDL	0.02
4V	Bis(chloromethyl)ether	BDL	0.15
5V	Bromoform	BDL	0.10
6V	Carbon Tetrachloride	BDL	0.02
7V	Chlorobenzene	BDL	0.15
8V	Chlorodibromomethane	BDL	0.15
9V	Chloroethane	BDL	0.15
10V	2-Chloroethylvinyl Ether	BDL	0.15
11V	Chloroform	BDL	0.15
12V	Dichlorobromomethane	BDL	0.15
13V	Dichlorodifluoromethane	BDL	0.15
14V	1,1-Dichloroethane	BDL	0.15
15V	1,2-Dichloroethane	BDL	0.10
16V	1,1-Dichloroethylene	BDL	0.15
17V	1,2-Dichloropropane	BDL	0.15
18V	1,2-Dichloropropylene	BDL	0.15
19V	Ethylbenzene	BDL	0.02
20V	Methyl Bromide	BDL	0.15
21V	Methyl Chloride	BDL	0.15
22V	Methylene Chloride	BDL	0.15
23V	1,1,2,2-Tetrachloroethane	BDL	0.15
24V	Tetrachloroethylene	BDL	0.10
25V	Toluene	BDL	0.02
26V	1,2-trans-Dichloroethylene	BDL	0.15
27V	1,1,1-Trichloroethane	BDL	0.15
28V	1,1,2-Trichloroethane	BDL	0.15
29V	Trichloroethylene	BDL	0.02
30V	Trichlorofluoromethane	BDL	0.02
31V	Vinyl Chloride	BDL	0.02
32V	Xylenes	BDL	0.15
33V	MIBK	<0.15	----

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600/4-82-057, July 1982.

Notes: ppm - parts per million
BDL - Below Detection Limits

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller

Lab I.D.: 86-1503-2

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Client: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Collector: Bob Baker (Bocskowsky)

Sample Site: Soil ST3 5'

Date and Time Collected: May 13, 1986 1:40 pm

Date and Time Samples Received: May 13, 1986 4:00 pm

Analysts: Bernie Fuson

Date Analyses Started: Date Analyses Completed:

Date Reported: June 23, 1986

Laboratory I.D. No.: 81142

Approved By: P Cameron

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1503-2
Date of Order: 5/13/86
Sample I.D.: Soil ST3 5'

Analysis	Results
Total Lead, ppm	<1
Arsenic, ppm	<0.01
Barium, ppm	<5
Selenium, ppm	<0.1
Silver, ppm	1.85
Chromium, ppm	29
Cadmium, ppm	<0.008
Zinc, ppm	2.6
Mercury, ppm	0.15
Total Solids, %	86.4%
Phenols, ppm	<0.025

Note: Results reported in ppm = mg/kg on dry basis.

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1503-2
Sample I.D.: Soil ST3 5'
Date of Order: May 13, 198

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppm	Detection Limit (ppm)
1V	Acrolein	BDL	3.0
2V	Acrylonitrile	BDL	3.0
3V	Benzene	BDL	0.02
4V	Bis(chloromethyl)ether	BDL	0.15
5V	Bromoform	BDL	0.10
6V	Carbon Tetrachloride	BDL	0.02
7V	Chlorobenzene	BDL	0.15
8V	Chlorodibromomethane	BDL	0.15
9V	Chloroethane	BDL	0.15
10V	2-Chloroethylvinyl Ether	BDL	0.15
11V	Chloroform	BDL	0.15
12V	Dichlorobromomethane	BDL	0.15
13V	Dichlorodifluoromethane	BDL	0.15
14V	1,1-Dichloroethane	BDL	0.15
15V	1,2-Dichloroethane	BDL	0.10
16V	1,1-Dichloroethylene	BDL	0.15
17V	1,2-Dichloropropane	BDL	0.15
18V	1,2-Dichloropropylene	BDL	0.15
19V	Ethylbenzene	BDL	0.02
20V	Methyl Bromide	BDL	0.15
21V	Methyl Chloride	BDL	0.15
22V	Methylene Chloride	BDL	0.15
23V	1,1,2,2-Tetrachloroethane	BDL	0.15
24V	Tetrachloroethylene	BDL	0.10
25V	Toluene	BDL	0.02
26V	1,2-trans-Dichloroethylene	BDL	0.15
27V	1,1,1-Trichloroethane	BDL	0.15
28V	1,1,2-Trichloroethane	BDL	0.15
29V	Trichloroethylene	BDL	0.02
30V	Trichlorofluoromethane	BDL	0.02
31V	Vinyl Chloride	BDL	0.02
32V	Xylenes	BDL	0.15
33V	MIBK	<0.15	

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppm - parts per million
BDL - Below Detection Limits

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller **Lab I.D.:** 86-1503-3

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Client: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Collector: Bob Baker (Bocskowsky)

Sample Site: Soil ST3 10'

Date and Time Collected: May 13, 1986 1:50 pm

Date and Time Samples Received: May 13, 1986 4:00 pm

Analysts: Bernie Fuson

Date Analyses Started: **Date Analyses Completed:**

Date Reported: June 23, 1986

Laboratory I.D. No.: 81142

Approved By: P Canevari

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1503-3
Date of Order: 5/13/86
Sample I.D.: Soil ST3 10'

Analysis	Results
Total Lead, ppm	<1
Arsenic, ppm	<0.01
Barium, ppm	<5
Selenium, ppm	<0.1
Silver, ppm	1.74
Chromium, ppm	24
Cadmium, ppm	<0.008
Zinc, ppm	<0.8
Mercury, ppm	0.11
Total Solids, %	86.2%
Phenols, ppm	<0.025

Note: Results reported in ppm = mg/kg on dry basis.

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1503-3
Sample I.D.: Soil ST3 10'
Date of Order: May 13, 198

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppm	Detection Limit (ppm)
1V	Acrolein	BDL	3.0
2V	Acrylonitrile	BDL	3.0
3V	Benzene	BDL	0.02
4V	Bis(chloromethyl)ether	BDL	0.15
5V	Bromoform	BDL	0.10
6V	Carbon Tetrachloride	BDL	0.02
7V	Chlorobenzene	BDL	0.15
8V	Chlorodibromomethane	BDL	0.15
9V	Chloroethane	BDL	0.15
10V	2-Chloroethylvinyl Ether	BDL	0.15
11V	Chloroform	BDL	0.15
12V	Dichlorobromomethane	BDL	0.15
13V	Dichlorodifluoromethane	BDL	0.15
14V	1,1-Dichloroethane	BDL	0.15
15V	1,2-Dichloroethane	BDL	0.10
16V	1,1-Dichloroethylene	BDL	0.15
17V	1,2-Dichloropropane	BDL	0.15
18V	1,2-Dichloropropylene	BDL	0.15
19V	Ethylbenzene	BDL	0.02
20V	Methyl Bromide	BDL	0.15
21V	Methyl Chloride	BDL	0.15
22V	Methylene Chloride	BDL	0.15
23V	1,1,2,2-Tetrachloroethane	BDL	0.15
24V	Tetrachloroethylene	BDL	0.10
25V	Toluene	BDL	0.02
26V	1,2-trans-Dichloroethylene	BDL	0.15
27V	1,1,1-Trichloroethane	BDL	0.15
28V	1,1,2-Trichloroethane	BDL	0.15
29V	Trichloroethylene	BDL	0.02
30V	Trichlorofluoromethane	BDL	0.02
31V	Vinyl Chloride	BDL	0.02
32V	Xylenes	BDL	0.15
33V	MIBK	<0.15	----

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppm - parts per million
BDL - Below Detection Limits

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller

Lab I.D.: 86-1503-4

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Client: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Collector: Bob Baker (Bocskowsky)

Sample Site: Soil ST3 15'

Date and Time Collected: May 13, 1986 2:00 pm

Date and Time Samples Received: May 13, 1986 4:00 pm

Analysts: Bernie Fuson

Date Analyses Started: Date Analyses Completed:

Date Reported: June 23, 1986

Laboratory I.D. No.: 81142

Approved By: Paul Cameron

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1503-4
Date of Order: 5/13/86
Sample I.D.: Soil ST3 15'

Analysis	Results
Total Lead, ppm	<1
Arsenic, ppm	<1
Barium, ppm	<5
Selenium, ppm	<0.1
Silver, ppm	0.98
Chromium, ppm	7.1
Cadmium, ppm	<0.008
Zinc, ppm	<0.8
Mercury, ppm	<0.01
Total Solids, %	84.5%
Phenols, ppm	<0.025

Note: Results reported in ppm = mg/kg on dry basis.

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDFR # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1503-4
Sample I.D.: Soil ST3 15'
Date of Order: May 13, 19

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppm	Detection Limit (ppm)
1V	Acrolein	BDL	3.0
2V	Acrylonitrile	BDL	3.0
3V	Benzene	BDL	0.02
4V	Bis(chloromethyl)ether	BDL	0.15
5V	Bromoform	BDL	0.10
6V	Carbon Tetrachloride	BDL	0.02
7V	Chlorobenzene	BDL	0.15
8V	Chlorodibromomethane	BDL	0.15
9V	Chloroethane	BDL	0.15
10V	2-Chloroethylvinyl Ether	BDL	0.15
11V	Chloroform	BDL	0.15
12V	Dichlorobromomethane	BDL	0.15
13V	Dichlorodifluoromethane	BDL	0.15
14V	1,1-Dichloroethane	BDL	0.15
15V	1,2-Dichloroethane	BDL	0.10
16V	1,1-Dichloroethylene	BDL	0.15
17V	1,2-Dichloropropane	BDL	0.15
18V	1,2-Dichloropropylene	BDL	0.15
19V	Ethylbenzene	BDL	0.02
20V	Methyl Bromide	BDL	0.15
21V	Methyl Chloride	BDL	0.15
22V	Methylene Chloride	BDL	0.15
23V	1,1,2,2-Tetrachloroethane	BDL	0.15
24V	Tetrachloroethylene	BDL	0.10
25V	Toluene	BDL	0.02
26V	1,2-trans-Dichloroethylene	BDL	0.15
27V	1,1,1-Trichloroethane	BDL	0.15
28V	1,1,2-Trichloroethane	BDL	0.15
29V	Trichloroethylene	BDL	0.02
30V	Trichlorofluoromethane	BDL	0.02
31V	Vinyl Chloride	BDL	0.02
32V	Xylenes	BDL	0.15
33V	MIBK	<0.15	----

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppm - parts per million
BDL - Below Detection Limits

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller

Lab I.D.: 86-1503-5

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Client: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Collector: Bob Baker (Bocskowsky)

Sample Site: Soil STE 20'

Date and Time Collected: May 13, 1986 2:00 pm

Date and Time Samples Received: May 13, 1986 4:00 pm

Analysts: Bernie Fuson

Date Analyses Started: Date Analyses Completed:

Date Reported: June 23, 1986

Laboratory I.D. No.: 81142

Approved By: P Cameron

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1503-5
Date of Order: 5/13/86
Sample I.D.: Soil ST3 20'

Analysis	Results
Total Lead, ppm	<1
Arsenic, ppm	<1
Barium, ppm	<5
Selenium, ppm	<0.1
Silver, ppm	1.09
Chromium, ppm	<1
Cadmium, ppm	<0.008
Zinc, ppm	<0.8
Mercury, ppm	0.16
Total Solids, %	91.3%
Phenols, ppm	<0.025

Note: Results reported in ppm = mg/kg on dry basis.

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDEP # EL020

Pioneer
LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1503-5
Sample I.D.: Soil STE 20'
Date of Order: May 13, 198

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppm	Detection Limit (ppm)
1V	Acrolein	BDL	3.0
2V	Acrylonitrile	BDL	3.0
3V	Benzene	BDL	0.02
4V	Bis(chloromethyl)ether	BDL	0.15
5V	Bromoform	BDL	0.10
6V	Carbon Tetrachloride	BDL	0.02
7V	Chlorobenzene	BDL	0.15
8V	Chlorodibromomethane	BDL	0.15
9V	Chloroethane	BDL	0.15
10V	2-Chloroethylvinyl Ether	BDL	0.15
11V	Chloroform	BDL	0.15
12V	Dichlorobromomethane	BDL	0.15
13V	Dichlorodifluoromethane	BDL	0.15
14V	1,1-Dichloroethane	BDL	0.15
15V	1,2-Dichloroethane	BDL	0.10
16V	1,1-Dichloroethylene	BDL	0.15
17V	1,2-Dichloropropane	BDL	0.15
18V	1,2-Dichloropropylene	BDL	0.15
19V	Ethylbenzene	BDL	0.02
20V	Methyl Bromide	BDL	0.15
21V	Methyl Chloride	BDL	0.15
22V	Methylene Chloride	BDL	0.15
23V	1,1,2,2-Tetrachloroethane	BDL	0.15
24V	Tetrachloroethylene	BDL	0.10
25V	Toluene	BDL	0.02
26V	1,2-trans-Dichloroethylene	BDL	0.15
27V	1,1,1-Trichloroethane	BDL	0.15
28V	1,1,2-Trichloroethane	BDL	0.15
29V	Trichloroethylene	BDL	0.02
30V	Trichlorofluoromethane	BDL	0.02
31V	Vinyl Chloride	BDL	0.02
32V	Xylenes	BDL	0.15
33V	MIBK	<0.15	----

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppm - parts per million
BDL - Below Detection Limits

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller

Lab I.D.: 86-1503-6

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Client: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Collector: Bob Baker (Bocskowsky)

Sample Site: Soil STE 25'

Date and Time Collected: May 13, 1986 2:20 pm

Date and Time Samples Received: May 13, 1986 4:00 pm

Analysts: Bernie Fuson

Date Analyses Started: Date Analyses Completed:

Date Reported: June 23, 1986

Laboratory I.D. No.: 81142

Approved By: Paul Canevari

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1503-6
Date of Order: 5/13/86
Sample I.D.: Soil STE 25'

Analysis	Results
Total Lead, ppm	<1
Arsenic, ppm	<1
Barium, ppm	<5
Selenium, ppm	<0.1
Silver, ppm	0.75
Chromium, ppm	<1
Cadmium, ppm	<0.008
Zinc, ppm	<0.8
Mercury, ppm	0.22
Total Solids, %	95.5%
Phenols, ppm	<0.025

Note: Results reported in ppm = mg/kg on dry basis.

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1503-6
Sample I.D.: Soil STE 25'
Date of Order: May 13, 198

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppm	Detection Limit (ppm)
1V	Acrolein	BDL	3.0
2V	Acrylonitrile	BDL	3.0
3V	Benzene	BDL	0.02
4V	Bis(chloromethyl)ether	BDL	0.15
5V	Bromoform	BDL	0.10
6V	Carbon Tetrachloride	BDL	0.02
7V	Chlorobenzene	BDL	0.15
8V	Chlorodibromomethane	BDL	0.15
9V	Chloroethane	BDL	0.15
10V	2-Chloroethylvinyl Ether	BDL	0.15
11V	Chloroform	BDL	0.15
12V	Dichlorobromomethane	BDL	0.15
13V	Dichlorodifluoromethane	BDL	0.15
14V	1,1-Dichloroethane	BDL	0.15
15V	1,2-Dichloroethane	BDL	0.10
16V	1,1-Dichloroethylene	BDL	0.15
17V	1,2-Dichloropropane	BDL	0.15
18V	1,2-Dichloropropylene	BDL	0.15
19V	Ethylbenzene	BDL	0.02
20V	Methyl Bromide	BDL	0.15
21V	Methyl Chloride	BDL	0.15
22V	Methylene Chloride	BDL	0.15
23V	1,1,2,2-Tetrachloroethane	BDL	0.15
24V	Tetrachloroethylene	BDL	0.10
25V	Toluene	BDL	0.02
26V	1,2-trans-Dichloroethylene	BDL	0.15
27V	1,1,1-Trichloroethane	BDL	0.15
28V	1,1,2-Trichloroethane	BDL	0.15
29V	Trichloroethylene	BDL	0.02
30V	Trichlorofluoromethane	BDL	0.02
31V	Vinyl Chloride	BDL	0.02
32V	Xylenes	BDL	0.15
33V	MIBK	<0.15	----

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppm - parts per million
BDL - Below Detection Limits

Chemical Analysis of Water From the Paint Stripping Rinse Tank at Building 2941.

TECHNICAL SERVICES, INC.

ENVIRONMENTAL CONSULTANTS — INDUSTRIAL CHEMISTS
105 STOCKTON STREET — P.O. BOX 52329
JACKSONVILLE, FLORIDA 32201
(904) 353-5761

Laboratory No. 40946

June 16, 1981

Sample of Paint Stripping Waste

Date Received May 22, 1981

For OFFICER IN CHARGE OF CONSTRUCTION, Building 1429, Naval Air Stati
Whiting Field, Milton, Florida 32570

Marks: PO#N62467-80-C-0464, Industrial Waste from Aircraft Maintenance Dept,N
Whiting Field, Milton, Florida

CERTIFICATE OF ANALYSIS OR TESTS

Ignitability:	Non-flammable
Corrosivity:	pH 7.40, not corrosive based on pH corrosivity characteristic.
Reactivity:	Non-reactive (by definition)
Total Phenols	1866 mg/l
Total Suspended Solids	184 mg/l
Total Organic Carbon	2140 mg/l

E.P.TOXICITY:

Arsenic, mg/l	< 0.001
Barium, mg/l	0.20
Cadmium, mg/l	0.10
Chromium, mg/l	36.2
Lead, mg/l	0.093
Mercury, mg/l	< 0.0004
Selenium, mg/l	<0.01
Silver, mg/l	<0.0007

NOTE: Paint stripper waste not expected to contain any pesticide residues.

cc: Mr. Laurens Pitts
SOUTHERN DIVISION
Naval Facilities Engineering Command
P.O. Box 10068
Charleston, S.C. 29411
ATTN: Mr. Joe McCulley

Respectfully submitted,

TECHNICAL SERVICES, INC.

BY Harvey C. Gray, Jr.

SITE 4
North AVGAS Tank Sludge Area

SITE 7
South AVGAS Tank Sludge Area

SITE 8
AVGAS Fuel Spill Area

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1830
Date of Order: June 10, 1986
Sampled By: Bobby Baker
Sample I.D.: Water Samples
Sites 4, 7 & 8
Project #T0290WHI

MONITOR WELLS
NAS Whiting Field Project

Analysis	Site 4	Site 7	Site 8
Benzene	17 ppb	8.8 ppm	2 ppb
Toluene	10 ppb	43.8 ppm	26 ppb
Xylene	<0.5 ppb	1.0 ppm	<0.5 ppb
Napthalene	<10 ppb	<14 ppb	<10 ppb
EDB	<0.02 ppb	23.56 ppb	<0.02 ppb
Lead	0.005 ppm	0.862 ppm	0.007 ppm

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: Paul Canevari

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1806
Date of Order: June 6, 1986
Sampled By: Bobby Baker
Sample I.D.: Soil Samples
Sites 4, 7 & 12
Project #T0290WHI

SOIL SAMPLES

NAS Whiting Field Project

Pioneer I.D.	Sample I.D.	Total Solids %	Total Lead	E.P. Toxicity Lead
86-1806-1	Site 4 (a)	96.6%	27 mg/kg	<0.01 mg/l
	Site 4 (b)	96.1%	15 mg/kg	<0.01 mg/l
86-1806-2	Site 7 (a)	94.3%	575 mg/kg	<0.01 mg/l
	Site 7 (b)	95.1%	132 mg/kg	<0.01 mg/l
86-1806-4	Site 12 (a)	93.7%	11 mg/kg	<0.01 mg/l
	Site 12 (b)	94.1%	4 mg/kg	<0.01 mg/l

Note: ppm = parts per million, mg/kg on dry basis
ppm = parts per million, mg/l
< = less than

Approved By: Paul Canevari

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1806
Date of Order: June 6, 1986
Sampled By: Bobby Baker
Sample I.D.: Soil Samples
Site 8
Project #T0290WHI

SOIL SAMPLES
NAS Whiting Field Project

Sample I.D.	Total Solids %	Total Lead	E.P. Toxicity Lead
HA 1	88.2 mg/kg	27 mg/kg	<0.01 mg/l
HA 2	80.2 mg/kg	14 mg/kg	<0.01 mg/l
HA 3	89.0 mg/kg	6.6 mg/kg	<0.01 mg/l
HA 4	95.4 mg/kg	14 mg/kg	<0.01 mg/l
HA 5	80.6 mg/kg	12 mg/kg	<0.01 mg/l
HA 6	91.5 mg/kg	6.7 mg/kg	<0.01 mg/l
HA 7	91.6 mg/kg	13 mg/kg	<0.01 mg/l
HA 8	91.8 mg/kg	13 mg/kg	<0.01 mg/l
HA 9	91.5 mg/kg	4.0 mg/kg	<0.01 mg/l
HA 10	93.1 mg/kg	8.5 mg/kg	<0.01 mg/l
HA 11	93.4 mg/kg	3.1 mg/kg	<0.01 mg/l
HA 12	94.6 mg/kg	5.5 mg/kg	<0.01 mg/l

Note: ppm = parts per million, mg/kg on dry basis
ppm = parts per million, mg/l
< = less than

Approved By: Paul Canevari

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

SITE 6

South Transformer Oil Disposal Area

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1807
Date of Order: June 6, 1986
Sampled By: Bobby Baker
Sample I.D.: Soil Samples
Project #T0290WHI

SOIL SAMPLES

NAS Whiting Field Project

Polychlorinated Biphenyls

Sample I.D.	Results	Detection Limit
HA 1	BDL	0.2
HA 2	BDL	0.2
HA 3	BDL	0.2
HA 4	BDL	0.2
HA 5	BDL	0.2
HA 6	BDL	0.2
HA 7	BDL	0.2
HA 8	BDL	0.2
HA 9	BDL	0.2
HA 10	BDL	0.2

Note: ppm = parts per million, mg/kg on dry basis

Approved By: Paul Canevari

SITE 9

Waste Fuel Disposal Pit

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1815
Date of Order: June 9, 1986
Sample I.D.: Site #9/Water

MONITOR WELL 9

Site #9

Analysis	Results	Det.Limit
Benzene, ppb	BDL	<1
Toluene, ppb	BDL	<1
Xylene, ppb	BDL	<5
Ethylene Dibromide, ppb	BDL	<0.02
Total Lead, ppm	0.007	<0.01
pH, units	8.99	-----
Conductivity, microumhos/cm	200	-----

Note: BDL = below detection limits
ppb = parts per billion
ppm = parts per million
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • DER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1808
Date of Order: June 6, 1986
Sample I.D.: Soil Samples
Site 9

SOIL SAMPLES

NAS WHITING FIELD PROJECT

Sample I.D.	Total Lead	EP Tox Lead	Benzene	Toluene	Xylene
Detection Limit	<0.2 ppm	<0.01 ppm	<30 ppb	<30 ppb	<150 ppb
HA 1 0.5-1'	11 ppm	BDL	BDL	BDL	BDL
HA 1 1-2'	12 ppm	BDL	BDL	BDL	BDL
HA 2 0.5-1'	14 ppm	BDL	BDL	BDL	BDL
HA 2 1-2'	11 ppm	BDL	BDL	BDL	BDL
HA 3 0.5-1'	11 ppm	BDL	BDL	BDL	BDL
HA 3 1-2'	11 ppm	BDL	BDL	BDL	BDL
HA 4 0.5-1'	14 ppm	BDL	BDL	BDL	BDL
HA 4 1-2'	11 ppm	BDL	BDL	BDL	BDL
HA 5 0.5-1'	12 ppm	BDL	BDL	BDL	BDL
HA 5 1-2'	14 ppm	BDL	BDL	BDL	BDL
HA 6 0.5-1'	9 ppm	BDL	BDL	BDL	BDL
HA 6 1-2'	14 ppm	BDL	BDL	BDL	BDL

Note: ppm = parts per million
ppb = parts per billion
BDL = below detection limit
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

SITE 10

Southeast Open Disposal Area (A)

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-1
Date: June 9, 1986
Sample I.D.: Site 10
NAS Whiting Field Project
#T0290WHI

MONITOR WELL 10
PRIORITY POLLUTANTS ANALYSIS

COVER SHEET FOR RESULTS

Collector:	Bobby Baker
Sample Site:	Site 10/Water
Date and Time Collected:	June 9, 1986 2:20 pm
Date and Time Samples Received:	June 9, 1986 4:00 pm
Analysts:	Julann Ring, David Bowers
Date Analyses Started:	June 13, 1986
Date Reported:	July 10, 1986

Laboratory I.D. No.: 81142

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-1
Sample Site: Site 10/Water
Date: June 9, 1986
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

ACID EXTRACTABLES

		Reported in ppb	Detection Limit (ppb)
1A	2-Chlorophenol	BDL	15
2A	2,4-Dichlorophenol	BDL	10
3A	2,4-Dimethylphenol	BDL	5
4A	4,6-Dinitro-o-Cresol	BDL	50
5A	2,4-Dinitrophenol	BDL	30
6A	2-Nitrophenol	BDL	10
7A	4-Nitrophenol	BDL	20
8A	p-Chloro-m-Cresol	BDL	25
9A	Pentachlorophenol	BDL	30
10A	Phenol	BDL	5
11A	2,4,6-Trichlorophenol	BDL	20

*EPA Method 604 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600 4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-1
Date: June 9, 1986
Sample I.D.: Site 10/Water
NAS Whiting Field Project #
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

BASE NEUTRAL EXTRACTABLES

		Reported in ppb	Detection Limit ppb			Reported in ppb	Det. Limit ppb
1B	Acenaphthene	BDL	10	24B	Diethylphthalate	BDL	10
2B	Acenaphthylene	BDL	10	25B	Dimethylpthalate	BDL	10
3B	Anthracene	BDL	10	26B	Di-n-Butyl Phthalate	BDL	10
4B	Benzidine	BDL	10	27B	2,4-Dinitrotoluene	BDL	10
5B	Benzo(a)anthracene	BDL	10	28B	2,6-Dintrotoluene	BDL	10
6B	Benzo(a)pyrene	BDL	10	29B	Di-n-Octyl-Phthalate	BDL	10
7B	3,4-Benzofluoranthene	BDL	10	30B	1,2-Diphenylhydrazine	BDL	10
8B	Benzo(ghi)perylene	BDL	10	31B	Fluoranthene	BDL	10
9B	Benzo(k)fluoranthane	BDL	10	32B	Fluorene	BDL	10
10B	Bis(2-chloroethoxy)methane	BDL	10	33B	Hexachlorobenzene	BDL	10
11B	Bis(2-chloroethyl)ether	BDL	10	34B	Hexachlorobutadiene	BDL	10
12B	Bis(2-chloroisopropyl)ether	BDL	10	35B	Hexachlorocyclopentadiene	BDL	10
13B	Bis(2-ethylhexyl)phthalate	BDL	10	36B	Hexachloroethane	BDL	10
14B	4-Bromophenyl Phenyl Ether	BDL	10	37B	Indeno(1,2,3-cd)pyrene	BDL	10
15B	Butylbenzyl Phthalate	BDL	10	38B	Isophorone	BDL	10
16B	2-Chloronaphthalene	BDL	10	39B	Naphthalene	BDL	10
17B	4-Chlorophenyl Phenyl Other	BDL	10	40B	Nitrobenzene	BDL	10
18B	Chrysene	BDL	10	41B	N-Nitrosodimethylamine	BDL	10
19B	Dibenzo(a,h)anthracene	BDL	25	42B	N-Nitrosodi-n-propylamine	BDL	10
20B	1,2-Dichlorobenzene	BDL	10	43B	N-Nitrosodiphenylamine	BDL	10
21B	1,3-Dichlorobenzene	BDL	10	44B	Phenanthrene	BDL	10
22B	1,4-Dichlorobenzene	BDL	10	45B	Pyrene	BDL	10
23B	3,3-Dichlorobenzidine	BDL	10	46B	1,2,4-Trichlorobenzene	BDL	10

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limit

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-1
Date: June 9, 1986
Sample I.D.: Site 10/Water
NAS Whiting Field Project
#T0290WHI

PRIORITY POLLUTANT ANALYSIS*

PESTICIDES

		Reported in ppb	Detection Limit (ppb)
1P	Aldrin	BDL	0.01
2P	a-BHC	BDL	0.01
3P	b-BHC	BDL	0.01
4P	g-BHC	BDL	0.01
5P	d-BHC	BDL	0.01
6P	Chlorodane	BDL	0.01
7P	4,4'-DDT	BDL	0.01
8P	4,4'-DDE	BDL	0.01
9P	4,4'-DDD	BDL	0.01
10P	Dieldrin	BDL	0.01
11P	a-Endosulfan I	BDL	0.01
12P	b-Endosulfan II	BDL	0.01
13P	Endosulfan Sulfate	BDL	0.01
14P	Endrin	BDL	0.07
15P	Endrin Aldehyde	BDL	0.03
16P	Heptachlor	BDL	0.01
17P	Heptachlor Epoxide	BDL	0.01
18P	PCB-1242	BDL	0.2
19P	PCB-1254	BDL	0.2
20P	PCB-1221	BDL	0.2
21P	PCB-1232	BDL	0.2
22P	PCB-1248	BDL	0.2
23P	PCB-1260	BDL	0.2
24P	PCB-1016	BDL	0.2
25P	Toxaphene	BDL	1
26P	Kepone	BDL	0.35
27P	Malathion	BDL	0.01

Herbicides:

1	2,4-D	BDL	20
2	2,4,5-TP Silvex	BDL	2

*EPA Method 608 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1816-1
Sample I.D.: Site 10
Water Samples
NAS Whiting Field
Project # TO29OWHI
Date: June 9, 1986

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1816-1
Date: June 9, 1986
Sample I.D. Site 10
Water
NAS Whiting Field Project # TO290WHI

Priority Pollutant Analysis

Priority Pollutant Compound		Sample Identification Priority Pollutant Concentration	
Metals, Cyanide and Phenols		ppm	ppb
1M	Antimony	<0.200	<200
2M	Arsenic	<0.001	<1
3M	Beryllium	<0.01	<10
4M	Cadmium	<0.0001	<0.1
5M	Chromium	<0.01	<10
6M	Copper	<0.01	<10
7M	Lead	0.006	6
8M	Mercury	<0.0001	<0.1
9M	Nickel	<0.05	<50
10M	Selenium	<0.001	<1
11M	Silver	0.0008	0.8
12M	Thallium	<0.1	<100
13M	Zinc	0.10	100
14	Cyanide	<0.005	<5
15	Phenols	<0.001	<1

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

SITE 11

Southeast Open Disposal Area (B)

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-2
Date: June 9, 1986
Sample I.D.: Site 11
NAS Whiting Field Project
#T0290WHI

MONITOR WELL 11

PRIORITY POLLUTANTS ANALYSIS

COVER SHEET FOR RESULTS

Collector:	Bobby Baker
Sample Site:	Site 11/Water
Date and Time Collected:	June 9, 1986 12:10 pm
Date and Time Samples Received:	June 9, 1986 4:00 pm
Analysts:	Julann Ring, David Bowers
Date Analyses Started:	June 13, 1986
Date Reported:	July 28, 1986

Laboratory I.D. No.: 81142

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-2
Sample Site: Site 11/Water
Date: June 9, 1986
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

ACID EXTRACTABLES

		Reported in ppb	Detection Limit (ppb)
1A	2-Chlorophenol	BDL	15
2A	2,4-Dichlorophenol	BDL	10
3A	2,4-Dimethylphenol	BDL	5
4A	4,6-Dinitro-o-Cresol	BDL	50
5A	2,4-Dinitrophenol	BDL	30
6A	2-Nitrophenol	BDL	10
7A	4-Nitrophenol	BDL	20
8A	p-Chloro-m-Cresol	BDL	25
9A	Pentachlorophenol	BDL	30
10A	Phenol	BDL	5
11A	2,4,6-Trichlorophenol	BDL	20

*EPA Method 604 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600 4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-2
Date: June 9, 1986
Sample I.D.: Site 11/Water
NAS Whiting Field Project #
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

BASE NEUTRAL EXTRACTABLES

		Reported in ppb	Detection Limit ppb			Reported in ppb	Det. Limit ppb
1B	Acenaphthene	BDL	10	24B	Diethylphthalate	BDL	10
2B	Acenaphthylene	BDL	10	25B	Dimethylpthalate	BDL	10
3B	Anthracene	BDL	10	26B	Di-n-Butyl Phthalate	BDL	10
4B	Benzidine	BDL	10	27B	2,4-Dinitrotoluene	BDL	10
5B	Benzo(a)anthracene	BDL	10	28B	2,6-Dintrotoluene	BDL	10
6B	Benzo(a)pyrene	BDL	10	29B	Di-n-Octyl-Phthalate	BDL	10
7B	3,4-Benzofluoranthene	BDL	10	30B	1,2-Diphenylhydrazine	BDL	10
8B	Benzo(ghi)perylene	BDL	10	31B	Fluoranthene	BDL	10
9B	Benzo(k)fluoranthane	BDL	10	32B	Fluorene	BDL	10
10B	Bis(2-chloroethoxy)methane	BDL	10	33B	Hexachlorobenzene	BDL	10
11B	Bis(2-chloroethyl)ether	BDL	10	34B	Hexachlorobutadiene	BDL	10
12B	Bis(2-chloroisopropyl)ether	BDL	10	35B	Hexachlorocyclopentadiene	BDL	10
13B	Bis(2-ethylhexyl)phthalate	23	10	36B	Hexachloroethane	BDL	10
14B	4-Bromophenyl Phenyl Ether	BDL	10	37B	Indeno(1,2,3-cd)pyrene	BDL	10
15B	Butylbenzyl Phthalate	BDL	10	38B	Isophorone	BDL	10
16B	2-Chloronaphthalene	BDL	10	39B	Naphthalene	BDL	10
17B	4-Chlorophenyl Phenyl Other	BDL	10	40B	Nitrobenzene	BDL	10
18B	Chrysene	BDL	10	41B	N-Nitrosodimethylamine	BDL	10
19B	Dibenzo(a,h)anthracene	BDL	25	42B	N-Nitrosodi-n-propylamine	BDL	10
20B	1,2-Dichlorobenzene	BDL	10	43B	N-Nitrosodiphenylamine	BDL	10
21B	1,3-Dichlorobenzene	BDL	10	44B	Phenanthrene	BDL	10
22B	1,4-Dichlorobenzene	BDL	10	45B	Pyrene	BDL	10
23B	3,3-Dichlorobenzidine	BDL	10	46B	1,2,4-Trichlorobenzene	BDL	10

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limit

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-2
Date: June 9, 1986
Sample I.D.: Site 11/Water
NAS Whiting Field Project
#T0290WHI

PRIORITY POLLUTANT ANALYSIS*

PESTICIDES

		Reported in ppb	Detection Limit (ppb)
1P	Aldrin	BDL	0.01
2P	a-BHC	BDL	0.01
3P	b-BHC	BDL	0.01
4P	g-BHC	BDL	0.01
5P	d-BHC	BDL	0.01
6P	Chlorodane	BDL	0.01
7P	4,4'-DDT	BDL	0.01
8P	4,4'-DDE	BDL	0.01
9P	4,4'-DDD	BDL	0.01
10P	Dieldrin	BDL	0.01
11P	a-Endosulfan I	BDL	0.01
12P	b-Endosulfan II	BDL	0.01
13P	Endosulfan Sulfate	BDL	0.01
14P	Endrin	BDL	0.07
15P	Endrin Aldehyde	BDL	0.03
16P	Heptachlor	BDL	0.01
17P	Heptachlor Epoxide	BDL	0.01
18P	PCB-1242	BDL	0.2
19P	PCB-1254	BDL	0.2
20P	PCB-1221	BDL	0.2
21P	PCB-1232	BDL	0.2
22P	PCB-1248	BDL	0.2
23P	PCB-1260	BDL	0.2
24P	PCB-1016	BDL	0.2
25P	Toxaphene	BDL	1
26P	Kepone	BDL	0.35
27P	Malathion	BDL	0.01

Herbicides:

1	2,4-D	BDL	20
2	2,4,5-TP Silvex	BDL	2

*EPA Method 608 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PFL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1816-2
Sample I.D.: Site 11
Water Samples
NAS Whiting Field
Project # TO29OWHI
Date: June 9, 1986

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1816-2
Date: June 9, 1986
Sample I.D. Site 11
Water
NAS Whiting Field Project # TO290WHI

Priority Pollutant Analysis

Priority Pollutant Compound		Sample Identification Priority Pollutant Concentration	
Metals, Cyanide and Phenols		ppm	ppb
1M	Antimony	<0.200	<200
2M	Arsenic	<0.001	<1
3M	Beryllium	<0.01	<10
4M	Cadmium	<0.0001	<0.1
5M	Chromium	<0.01	<10
6M	Copper	<0.01	<10
7M	Lead	<0.001	<1
8M	Mercury	0.0015	1.5
9M	Nickel	<0.05	<50
10M	Selenium	<0.001	<1
11M	Silver	<0.0001	<0.1
12M	Thallium	<0.1	<100
13M	Zinc	0.05	50
14	Cyanide	<0.005	<5
15	Phenols	<0.001	<1

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

SITE 12

Tetraethyl Lead Disposal Area

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1817
Date of Order: June 9, 1986
Sample I.D.: Site #12/Water

MONITOR WELL 12
Site #12

Analysis	Results	Det.Limit
Benzene, ppb	BDL	<1
Toluene, ppb	BDL	<1
Xylene, ppb	BDL	<5
Ethylene Dibromide, ppb	BDL	<0.02
Napthalene, ppb	BDL	<10
Total Lead, ppm	0.002	<0.01
pH, units	7.39	-----
Conductivity, microumhos/cm	650	-----

Note: BDL = below detection limits
ppb = parts per billion
ppm = parts per million
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1817
Date of Order: June 9, 1986
Sample I.D.: Site #12/Water

SOIL SAMPLES

Site #12

Analysis	Results	Det.Limit
Benzene, ppb	BDL	<1
Toluene, ppb	BDL	<1
Xylene, ppb	BDL	<5
Ethylene Dibromide, ppb	BDL	<0.02
Napthalene, ppb	BDL	<10
Total Lead, ppm	0.002	<0.01
pH, units	7.39	-----
Conductivity, microumhos/cm	650	-----

Note: BDL = below detection limits
ppb = parts per billion
ppm = parts per million
< = less than

Approved By: W. F. Bowers

SITE 13

Sanitary Landfill

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-3
Date: June 9, 1986
Sample I.D.: Site 13
NAS Whiting Field Project
#T0290WHI

MONITOR WELL 13
PRIORITY POLLUTANTS ANALYSIS
COVER SHEET FOR RESULTS

Collector:	Bobby Baker
Sample Site:	Site 13/Water
Date and Time Collected:	June 9, 1986 12:45 pm
Date and Time Samples Received:	June 9, 1986 4:00 pm
Analysts:	Julann Ring, David Bowers
Date Analyses Started:	June 13, 1986
Date Reported:	July 11, 1986

Laboratory I.D. No.: 81142

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-3
Sample Site: Site 13/Water
Date: June 9, 1986
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

ACID EXTRACTABLES

		Reported in ppb	Detection Limit (ppb)
1A	2-Chlorophenol	BDL	15
2A	2,4-Dichlorophenol	BDL	10
3A	2,4-Dimethylphenol	BDL	5
4A	4,6-Dinitro-o-Cresol	BDL	50
5A	2,4-Dinitrophenol	BDL	30
6A	2-Nitrophenol	BDL	10
7A	4-Nitrophenol	BDL	20
8A	p-Chloro-m-Cresol	BDL	25
9A	Pentachlorophenol	BDL	30
10A	Phenol	BDL	5
11A	2,4,6-Trichlorophenol	BDL	20

*EPA Method 604 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600 4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-3
Date: June 9, 1986
Sample I.D.: Site 13/Water
NAS Whiting Field Project #
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

BASE NEUTRAL EXTRACTABLES

		Reported in ppb	Detection Limit ppb			Reported in ppb	Det. Limit ppb
1B	Acenaphthene	BDL	10	24B	Diethylphthalate	BDL	10
2B	Acenaphthylene	BDL	10	25B	Dimethylpthalate	BDL	10
3B	Anthracene	BDL	10	26B	Di-n-Butyl Phthalate	BDL	10
4B	Benzidine	BDL	10	27B	2,4-Dinitrotoluene	BDL	10
5B	Benzo(a)anthracene	BDL	10	28B	2,6-Dintrotoluene	BDL	10
6B	Benzo(a)pyrene	BDL	10	29B	Di-n-Octyl-Phthalate	BDL	10
7B	3,4-Benzofluoranthene	BDL	10	30B	1,2-Diphenylhydrazine	BDL	10
8B	Benzo(ghi)perylene	BDL	10	31B	Fluoranthene	BDL	10
9B	Benzo(k)fluoranthane	BDL	10	32B	Fluorene	BDL	10
10B	Bis(2-chloroethoxy)methane	BDL	10	33B	Hexachlorobenzene	BDL	10
11B	Bis(2-chloroethyl)ether	BDL	10	34B	Hexachlorobutadiene	BDL	10
12B	Bis(2-chloroisopropyl)ether	BDL	10	35B	Hexachlorocyclopentadiene	BDL	10
13B	Bis(2-ethylhexyl)phthalate	BDL	10	36B	Hexachloroethane	BDL	10
14B	4-Bromophenyl Phenyl Ether	BDL	10	37B	Indeno(1,2,3-cd)pyrene	BDL	10
15B	Butylbenzyl Phthalate	BDL	10	38B	Isophorone	BDL	10
16B	2-Chloronaphthalene	BDL	10	39B	Naphthalene	BDL	10
17B	4-Chlorophenyl Phenyl Other	BDL	10	40B	Nitrobenzene	BDL	10
18B	Chrysene	BDL	10	41B	N-Nitrosodimethylamine	BDL	10
19B	Dibenzo(a,h)anthracene	BDL	25	42B	N-Nitrosodi-n-propylamine	BDL	10
20B	1,2-Dichlorobenzene	BDL	10	43B	N-Nitrosodiphenylamine	BDL	10
21B	1,3-Dichlorobenzene	BDL	10	44B	Phenanthrene	BDL	10
22B	1,4-Dichlorobenzene	BDL	10	45B	Pyrene	BDL	10
23B	3,3-Dichlorobenzidine	BDL	10	46B	1,2,4-Trichlorobenzene	BDL	10

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limit

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-3
Date: June 9, 1986
Sample I.D.: Site 13/Water
NAS Whiting Field Project
#T0290WHI

PRIORITY POLLUTANT ANALYSIS*

PESTICIDES

		Reported in ppb	Detection Limit (ppb)
1P	Aldrin	BDL	0.01
2P	a-BHC	BDL	0.01
3P	b-BHC	BDL	0.01
4P	g-BHC	BDL	0.01
5P	d-BHC	BDL	0.01
6P	Chlorodane	BDL	0.01
7P	4,4'-DDT	BDL	0.01
8P	4,4'-DDE	BDL	0.01
9P	4,4'-DDD	BDL	0.01
10P	Dieldrin	BDL	0.01
11P	a-Endosulfan I	BDL	0.01
12P	b-Endosulfan II	BDL	0.01
13P	Endosulfan Sulfate	BDL	0.01
14P	Endrin	BDL	0.07
15P	Endrin Aldehyde	BDL	0.03
16P	Heptachlor	BDL	0.01
17P	Heptachlor Epoxide	BDL	0.01
18P	PCB-1242	BDL	0.2
19P	PCB-1254	BDL	0.2
20P	PCB-1221	BDL	0.2
21P	PCB-1232	BDL	0.2
22P	PCB-1248	BDL	0.2
23P	PCB-1260	BDL	0.2
24P	PCB-1016	BDL	0.2
25P	Toxaphene	BDL	1
26P	Kepone	BDL	0.35
27P	Malathion	BDL	0.01

Herbicides:

1	2,4-D	BDL	20
2	2,4,5-TP Silvex	BDL	2

*EPA Method 608 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1816-3
Sample I.D.: Site 13
Water Samples
NAS Whiting Field
Project # TO29OWHI
Date: June 9, 1986

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1816-3
Date: June 9, 1986
Sample I.D. Site 13
Water
NAS Whiting field Project # TO29OWHI

Priority Pollutant Analysis

Priority Pollutant Compound		Sample Identification Priority Pollutant Concentration	
Metals, Cyanide and Phenols		ppm	ppb
1M	Antimony	<0.200	<200
2M	Arsenic	<0.001	<1
3M	Beryllium	<0.01	<10
4M	Cadmium	<0.0001	<0.1
5M	Chromium	<0.01	<10
6M	Copper	<0.01	<10
7M	Lead	0.006	6
8M	Mercury	0.0005	0.5
9M	Nickel	0.06	60
10M	Selenium	<0.001	<1
11M	Silver	<0.0001	<0.1
12M	Thallium	<0.1	<100
13M	Zinc	0.24	240
14	Cyanide	<0.005	<5
15	Phenols	<0.001	<1

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

SITE 14

Short-Term Sanitary Landfill

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-4
Date: June 9, 1986
Sample I.D.: Site 14
NAS Whiting Field Project
#T0290WHI

MONITOR WELL 14

PRIORITY POLLUTANTS ANALYSIS

COVER SHEET FOR RESULTS

Collector:	Bobby Baker
Sample Site:	Site 14/Water
Date and Time Collected:	June 9, 1986 11:20 am
Date and Time Samples Received:	June 9, 1986 4:00 pm
Analysts:	Julann Ring, David Bowers
Date Analyses Started:	June 13, 1986
Date Reported:	July 28, 1986

Laboratory I.D. No.: 81142

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-4
Sample Site: Site 14/Water
Date: June 9, 1986
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

ACID EXTRACTABLES

		Reported in ppb	Detection Limit (ppb)
1A	2-Chlorophenol	BDL	15
2A	2,4-Dichlorophenol	BDL	10
3A	2,4-Dimethylphenol	BDL	5
4A	4,6-Dinitro-o-Cresol	BDL	50
5A	2,4-Dinitrophenol	BDL	30
6A	2-Nitrophenol	BDL	10
7A	4-Nitrophenol	BDL	20
8A	p-Chloro-m-Cresol	BDL	25
9A	Pentachlorophenol	BDL	30
10A	Phenol	BDL	5
11A	2,4,6-Trichlorophenol	BDL	20

*EPA Method 604 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600 4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-4
Date: June 9, 1986
Sample I.D.: Site 14/Water
NAS Whiting Field Project #
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

BASE NEUTRAL EXTRACTABLES

		Reported in ppb	Detection Limit ppb			Reported in ppb	Det. Limit ppb
1B	Acenaphthene	BDL	10	24B	Diethylphthalate	BDL	10
2B	Acenaphthylene	BDL	10	25B	Dimethylpthalate	BDL	10
3B	Anthracene	BDL	10	26B	Di-n-Butyl Phthalate	BDL	10
4B	Benzidine	BDL	10	27B	2,4-Dinitrotoluene	BDL	10
5B	Benzo(a)anthracene	BDL	10	28B	2,6-Dintrotoluene	BDL	10
6B	Benzo(a)pyrene	BDL	10	29B	Di-n-Octyl-Phthalate	BDL	10
7B	3,4-Benzofluoranthene	BDL	10	30B	1,2-Diphenylhydrazine	BDL	10
8B	Benzo(ghi)perylene	BDL	10	31B	Fluoranthene	BDL	10
9B	Benzo(k)fluoranthane	BDL	10	32B	Fluorene	BDL	10
10B	Bis(2-chloroethoxy)methane	BDL	10	33B	Hexachlorobenzene	BDL	10
11B	Bis(2-chloroethyl)ether	BDL	10	34B	Hexachlorobutadiene	BDL	10
12B	Bis(2-chloroisopropyl)ether	BDL	10	35B	Hexachlorocyclopentadiene	BDL	10
13B	Bis(2-ethylhexyl)phthalate	BDL	10	36B	Hexachloroethane	BDL	10
14B	4-Bromophenyl Phenyl Ether	BDL	10	37B	Indeno(1,2,3-cd)pyrene	BDL	10
15B	Butylbenzyl Phthalate	BDL	10	38B	Isophorone	BDL	10
16B	2-Chloronaphthalene	BDL	10	39B	Naphthalene	BDL	10
17B	4-Chlorophenyl Phenyl Other	BDL	10	40B	Nitrobenzene	BDL	10
18B	Chrysene	BDL	10	41B	N-Nitrosodimethylamine	BDL	10
19B	Dibenzo(a,h)anthracene	BDL	25	42B	N-Nitrosodi-n-propylamine	BDL	10
20B	1,2-Dichlorobenzene	BDL	10	43B	N-Nitrosodiphenylamine	BDL	10
21B	1,3-Dichlorobenzene	BDL	10	44B	Phenanthrene	BDL	10
22B	1,4-Dichlorobenzene	BDL	10	45B	Pyrene	BDL	10
23B	3,3-Dichlorobenzidine	BDL	10	46B	1,2,4-Trichlorobenzene	BDL	10

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limit

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-4
Date: June 9, 1986
Sample I.D.: Site 14/Water
NAS Whiting Field Project
#T0290WHI

PRIORITY POLLUTANT ANALYSIS*

PESTICIDES

		Reported in ppb	Detection Limit (ppb)
1P	Aldrin	BDL	0.01
2P	a-BHC	BDL	0.01
3P	b-BHC	BDL	0.01
4P	g-BHC	BDL	0.01
5P	d-BHC	BDL	0.01
6P	Chlorodane	BDL	0.01
7P	4,4'-DDT	BDL	0.01
8P	4,4'-DDE	BDL	0.01
9P	4,4'-DDD	BDL	0.01
10P	Dieldrin	BDL	0.01
11P	a-Endosulfan I	BDL	0.01
12P	b-Endosulfan II	BDL	0.01
13P	Endosulfan Sulfate	BDL	0.01
14P	Endrin	BDL	0.07
15P	Endrin Aldehyde	BDL	0.03
16P	Heptachlor	BDL	0.01
17P	Heptachlor Epoxide	BDL	0.01
18P	PCB-1242	BDL	0.2
19P	PCB-1254	BDL	0.2
20P	PCB-1221	BDL	0.2
21P	PCB-1232	BDL	0.2
22P	PCB-1248	BDL	0.2
23P	PCB-1260	BDL	0.2
24P	PCB-1016	BDL	0.2
25P	Toxaphene	BDL	1
26P	Kepone	BDL	0.35
27P	Malathion	BDL	0.01

Herbicides:

1	2,4-D	BDL	20
2	2,4,5-TP Silvex	BDL	2

*EPA Method 608 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limits

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1816-4
Sample I.D.: Site 14
Water Samples
NAS Whiting Field
Project # TO29OWHI
Date: June 9, 1986

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1816-4
Date: June 9, 1986
Sample I.D. Site 14
Water
NAS Whiting Field Project # TO290WHI

Priority Pollutant Analysis

Priority Pollutant Compound		Sample Identification Priority Pollutant Concentration	
Metals, Cyanide and Phenols		ppm	ppb
1M	Antimony	<0.200	<200
2M	Arsenic	<0.001	<1
3M	Beryllium	<0.01	<10
4M	Cadmium	<0.0001	<0.1
5M	Chromium	<0.01	<10
6M	Copper	<0.01	<10
7M	Lead	0.003	3
8M	Mercury	<0.0001	<0.1
9M	Nickel	<0.05	<50
10M	Selenium	<0.001	<1
11M	Silver	<0.0001	<0.1
12M	Thallium	<0.1	<100
13M	Zinc	0.11	110
14	Cyanide	<0.005	<5
15	Phenols	<0.001	<1

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

SITE 15

Southwest Landfill

Pioneer
LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-5
Date: June 9, 1986
Sample I.D.: Site 15
NAS Whiting Field Project
#T0290WHI

MONITOR WELL 15

PRIORITY POLLUTANTS ANALYSIS

COVER SHEET FOR RESULTS

Collector:	Bobby Baker
Sample Site:	Site 15/Water
Date and Time Collected:	June 9, 1986 9:30 am
Date and Time Samples Received:	June 9, 1986 4:00 pm
Analysts:	Julann Ring, David Bowers
Date Analyses Started:	June 13, 1986
Date Reported:	July 28, 1986

Laboratory I.D. No.: 81142

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-5
Sample Site: Site 15/Water
Date: June 9, 1986
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

ACID EXTRACTABLES

		Reported in ppb	Detection Limit (ppb)
1A	2-Chlorophenol	BDL	15
2A	2,4-Dichlorophenol	BDL	10
3A	2,4-Dimethylphenol	BDL	5
4A	4,6-Dinitro-o-Cresol	BDL	50
5A	2,4-Dinitrophenol	BDL	30
6A	2-Nitrophenol	BDL	10
7A	4-Nitrophenol	BDL	20
8A	p-Chloro-m-Cresol	BDL	25
9A	Pentachlorophenol	BDL	30
10A	Phenol	BDL	5
11A	2,4,6-Trichlorophenol	BDL	20

*EPA Method 604 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600 4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-5
Date: June 9, 1986
Sample I.D.: Site 15/Water
NAS Whiting Field Project #
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

BASE NEUTRAL EXTRACTABLES

		Reported in ppb	Detection Limit ppb			Reported in ppb	Det. Limit ppb
1B	Acenaphthene	BDL	10	24B	Diethylphthalate	BDL	10
2B	Acenaphthylene	BDL	10	25B	Dimethylpthalate	BDL	10
3B	Anthracene	BDL	10	26B	Di-n-Butyl Phthalate	BDL	10
4B	Benzidine	BDL	10	27B	2,4-Dinitrotoluene	BDL	10
5B	Benzo(a)anthracene	BDL	10	28B	2,6-Dintrotoluene	BDL	10
6B	Benzo(a)pyrene	BDL	10	29B	Di-n-Octyl-Phthalate	BDL	10
7B	3,4-Benzofluoranthene	BDL	10	30B	1,2-Diphenylhydrazine	BDL	10
8B	Benzo(ghi)perylene	BDL	10	31B	Fluoranthene	BDL	10
9B	Benzo(k)fluoranthane	BDL	10	32B	Fluorene	BDL	10
10B	Bis(2-chloroethoxy)methane	BDL	10	33B	Hexachlorobenzene	BDL	10
11B	Bis(2-chloroethyl)ether	BDL	10	34B	Hexachlorobutadiene	BDL	10
12B	Bis(2-chloroisopropyl)ether	BDL	10	35B	Hexachlorocyclopentadiene	BDL	10
13B	Bis(2-ethylhexyl)phthalate	118	10	36B	Hexachloroethane	BDL	10
14B	4-Bromophenyl Phenyl Ether	BDL	10	37B	Indeno(1,2,3-cd)pyrene	BDL	10
15B	Butylbenzyl Phthalate	BDL	10	38B	Isophorone	BDL	10
16B	2-Chloronaphthalene	BDL	10	39B	Naphthalene	BDL	10
17B	4-Chlorophenyl Phenyl Other	BDL	10	40B	Nitrobenzene	BDL	10
18B	Chrysene	BDL	10	41B	N-Nitrosodimethylamine	BDL	10
19B	Dibenzo(a,h)anthracene	BDL	25	42B	N-Nitrosodi-n-propylamine	BDL	10
20B	1,2-Dichlorobenzene	BDL	10	43B	N-Nitrosodiphenylamine	BDL	10
21B	1,3-Dichlorobenzene	BDL	10	44B	Phenanthrene	BDL	10
22B	1,4-Dichlorobenzene	BDL	10	45B	Pyrene	BDL	10
23B	3,3-Dichlorobenzidine	BDL	10	46B	1,2,4-Trichlorobenzene	BDL	10

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limit

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-5
Date: June 9, 1986
Sample I.D.: Site 15/Water
NAS Whiting Field Project
#T0290WHI

PRIORITY POLLUTANT ANALYSIS*

PESTICIDES

		Reported in ppb	Detection Limit (ppb)
1P	Aldrin	BDL	0.01
2P	a-BHC	BDL	0.01
3P	b-BHC	BDL	0.01
4P	g-BHC	BDL	0.01
5P	d-BHC	BDL	0.01
6P	Chlorodane	BDL	0.01
7P	4,4'-DDT	BDL	0.01
8P	4,4'-DDE	BDL	0.01
9P	4,4'-DDD	BDL	0.01
10P	Dieldrin	BDL	0.01
11P	a-Endosulfan I	BDL	0.01
12P	b-Endosulfan II	BDL	0.01
13P	Endosulfan Sulfate	BDL	0.01
14P	Endrin	BDL	0.07
15P	Endrin Aldehyde	BDL	0.03
16P	Heptachlor	BDL	0.01
17P	Heptachlor Epoxide	BDL	0.01
18P	PCB-1242	BDL	0.2
19P	PCB-1254	BDL	0.2
20P	PCB-1221	BDL	0.2
21P	PCB-1232	BDL	0.2
22P	PCB-1248	BDL	0.2
23P	PCB-1260	BDL	0.2
24P	PCB-1016	BDL	0.2
25P	Toxaphene	BDL	1
26P	Kepone	BDL	0.35
27P	Malathion	BDL	0.01

Herbicides:

1	2,4-D	BDL	20
2	2,4,5-TP Silvex	BDL	2

*EPA Method 608 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600 4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1816-5
Sample I.D.: Site 15
Water Samples
NAS Whiting Field
Project # TO29OWHI
Date: June 9, 1986

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.**

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1816-5
Date: June 9, 1986
Sample I.D. Site 15
Water
NAS Whiting Field Project # TO290WHI

Priority Pollutant Analysis

Priority Pollutant Compound		Sample Identification Priority Pollutant Concentration	
Metals, Cyanide and Phenols		ppm	ppb
1M	Antimony	<0.200	<200
2M	Arsenic	<0.001	<1
3M	Beryllium	<0.01	<10
4M	Cadmium	<0.0001	<0.1
5M	Chromium	<0.01	<10
6M	Copper	<0.01	<10
7M	Lead	0.003	3
8M	Mercury	<0.0001	<0.1
9M	Nickel	<0.05	<50
10M	Selenium	<0.001	<1
11M	Silver	<0.0001	<0.1
12M	Thallium	<0.1	<100
13M	Zinc	0.06	60
14	Cyanide	<0.005	<5
15	Phenols	<0.001	<1

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

SITE 16

Open Disposal and Burning Area

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

To: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-6
Date: June 9, 1986
Sample I.D.: Site 16
NAS Whiting Field Project
#T0290WHI

MONITOR WELL 16

PRIORITY POLLUTANTS ANALYSIS

COVER SHEET FOR RESULTS

Collector:	Bobby Baker
Sample Site:	Site 16/Water
Date and Time Collected:	June 9, 1986 10:10 am
Date and Time Samples Received:	June 9, 1986 4:00 pm
Analysts:	Julann Ring, David Bowers
Date Analyses Started:	June 13, 1986
Date Reported:	July 28, 1986

Laboratory I.D. No.: 81142

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. #86-1816-6
Sample I.D.: Site 16
Water Samples
NAS Whiting Field
Project # TO29OWHI
Date: June 9, 1986

PRIORITY POLLUTANT ANALYSIS*

VOLATILES

		Reported in ppb	Detection Limit (ppb)
1V	Acrolein	BDL	100
2V	Acrylonitrile	BDL	100
3V	Benzene	BDL	1
4V	Bis(chloromethyl)ether	BDL	5
5V	Bromoform	BDL	5
6V	Carbon Tetrachloride	BDL	3
7V	Chlorobenzene	BDL	1
8V	Chlorodibromomethane	BDL	5
9V	Chloroethane	BDL	5
10V	2-Chloroethylvinyl Ether	BDL	5
11V	Chloroform	BDL	5
12V	Dichlorobromomethane	BDL	5
13V	Dichlorodifluoromethane	BDL	5
14V	1,1-Dichloroethane	BDL	5
15V	1,2-Dichloroethane	BDL	3
16V	1,1-Dichloroethylene	BDL	5
17V	1,2-Dichloropropane	BDL	5
18V	1,2-Dichloropropylene	BDL	5
19V	Ethylbenzene	BDL	1
20V	Methyl Bromide	BDL	5
21V	Methyl Chloride	BDL	5
22V	Methylene Chloride	BDL	5
23V	1,1,2,2-Tetrachloroethane	BDL	5
24V	Tetrachloroethylene	BDL	3
25V	Toluene	BDL	1
26V	1,2-trans-Dichloroethylene	BDL	5
27V	1,1,1-Trichloroethane	BDL	5
28V	1,1,2-Trichloroethane	BDL	5
29V	Trichloroethylene	BDL	1
30V	Trichlorofluoromethane	BDL	5
31V	Vinyl Chloride	BDL	1

*EPA Method 624 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PLI LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D.: 86-1816-6
Sample Site: Site 16/Water
Date: June 9, 1986
NAS Whiting Field Project
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

ACID EXTRACTABLES

		Reported in ppb	Detection Limit (ppb)
1A	2-Chlorophenol	BDL	15
2A	2,4-Dichlorophenol	BDL	10
3A	2,4-Dimethylphenol	BDL	5
4A	4,6-Dinitro-o-Cresol	BDL	50
5A	2,4-Dinitrophenol	BDL	30
6A	2-Nitrophenol	BDL	10
7A	4-Nitrophenol	BDL	20
8A	p-Chloro-m-Cresol	BDL	25
9A	Pentachlorophenol	BDL	30
10A	Phenol	BDL	5
11A	2,4,6-Trichlorophenol	BDL	20

*EPA Method 604 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600 4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-6
Date: June 9, 1986
Sample I.D.: Site 16/Water
NAS Whiting Field Project #
T0290WHI

PRIORITY POLLUTANT ANALYSIS*

BASE NEUTRAL EXTRACTABLES

		Reported in ppb	Detection Limit ppb			Reported in ppb	Det. Limit ppb
1B	Acenaphthene	BDL	10	24B	Diethylphthalate	BDL	10
2B	Acenaphthylene	BDL	10	25B	Dimethylpthalate	BDL	10
3B	Anthracene	BDL	10	26B	Di-n-Butyl Phthalate	BDL	10
4B	Benzidine	BDL	10	27B	2,4-Dinitrotoluene	BDL	10
5B	Benzo(a)anthracene	BDL	10	28B	2,6-Dintrotoluene	BDL	10
6B	Benzo(a)pyrene	BDL	10	29B	Di-n-Octyl-Phthalate	BDL	10
7B	3,4-Benzofluoranthene	BDL	10	30B	1,2-Diphenylhydrazine	BDL	10
8B	Benzo(ghi)perylene	BDL	10	31B	Fluoranthene	BDL	10
9B	Benzo(k)fluoranthane	BDL	10	32B	Fluorene	BDL	10
10B	Bis(2-chloroethoxy)methane	BDL	10	33B	Hexachlorobenzene	BDL	10
11B	Bis(2-chloroethyl)ether	BDL	10	34B	Hexachlorobutadiene	BDL	10
12B	Bis(2-chloroisopropyl)ether	BDL	10	35B	Hexachlorocyclopentadiene	BDL	10
13B	Bis(2-ethylhexyl)phthalate	36	10	36B	Hexachloroethane	BDL	10
14B	4-Bromophenyl Phenyl Ether	BDL	10	37B	Indeno(1,2,3-cd)pyrene	BDL	10
15B	Butylbenzyl Phthalate	BDL	10	38B	Isophorone	BDL	10
16B	2-Chloronaphthalene	BDL	10	39B	Naphthalene	BDL	10
17B	4-Chlorophenyl Phenyl Other	BDL	10	40B	Nitrobenzene	BDL	10
18B	Chrysene	BDL	10	41B	N-Nitrosodimethylamine	BDL	10
19B	Dibenzo(a,h)anthracene	BDL	.25	42B	N-Nitrosodi-n-propylamine	BDL	10
20B	1,2-Dichlorobenzene	BDL	10	43B	N-Nitrosodiphenylamine	BDL	10
21B	1,3-Dichlorobenzene	BDL	10	44B	Phenanthrene	BDL	10
22B	1,4-Dichlorobenzene	BDL	10	45B	Pyrene	BDL	10
23B	3,3-Dichlorobenzidine	BDL	10	46B	1,2,4-Trichlorobenzene	BDL	10

*EPA Method 625 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater,** EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limit

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry
Tampa, FL 33618

Lab I.D. 86-1816-6
Date: June 9, 1986
Sample I.D.: Site 16/Water
NAS Whiting Field Project
#T0290WHI

PRIORITY POLLUTANT ANALYSIS*

PESTICIDES

		Reported in ppb	Detection Limit (ppb)
1P	Aldrin	BDL	0.01
2P	a-BHC	BDL	0.01
3P	b-BHC	BDL	0.01
4P	g-BHC	BDL	0.01
5P	d-BHC	BDL	0.01
6P	Chlorodane	BDL	0.01
7P	4,4'-DDT	BDL	0.01
8P	4,4'-DDE	BDL	0.01
9P	4,4'-DDD	BDL	0.01
10P	Dieldrin	BDL	0.01
11P	a-Endosulfan I	BDL	0.01
12P	b-Endosulfan II	BDL	0.01
13P	Endosulfan Sulfate	BDL	0.01
14P	Endrin	BDL	0.07
15P	Endrin Aldehyde	BDL	0.03
16P	Heptachlor	BDL	0.01
17P	Heptachlor Epoxide	BDL	0.01
18P	PCB-1242	BDL	0.2
19P	PCB-1254	BDL	0.2
20P	PCB-1221	BDL	0.2
21P	PCB-1232	BDL	0.2
22P	PCB-1248	BDL	0.2
23P	PCB-1260	BDL	0.2
24P	PCB-1016	BDL	0.2
25P	Toxaphene	BDL	1
26P	Kepone	BDL	0.35
27P	Malathion	BDL	0.01

Herbicides:

1	2,4-D	BDL	20
2	2,4,5-TP Silvex	BDL	2

*EPA Method 608 - Reference: **Method for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982.

Notes: ppb - parts per billion
BDL - Below Detection Limits

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

Pioneer
PL LABORATORY, INC.
11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904) 474-1001

TO: Geraghty & Miller
14310 North Dale Mabry Highway
Tampa, FL 33618

Lab I.D. 86-1816-6
Date: June 9, 1986
Sample I.D. Site 16
Water
NAS Whiting Field Project # TO290WHI

Priority Pollutant Analysis

Priority Pollutant Compound		Sample Identification Priority Pollutant Concentration	
Metals, Cyanide and Phenols		ppm	ppb
1M	Antimony	<0.200	<200
2M	Arsenic	<0.001	<1
3M	Beryllium	<0.01	<10
4M	Cadmium	<0.0001	<0.1
5M	Chromium	<0.01	<10
6M	Copper	<0.01	<10
7M	Lead	0.003	3
8M	Mercury	<0.0001	<0.1
9M	Nickel	<0.05	<50
10M	Selenium	<0.001	<1
11M	Silver	<0.0001	<0.1
12M	Thallium	<0.1	<100
13M	Zinc	0.03	30
14	Cyanide	<0.005	<5
15	Phenols	<0.001	<1

Note: ppm = parts per million
ppb = parts per billion
< = less than

Approved By: W. F. Bowers

CERTIFICATION NUMBERS: FL LAB ID # 81142 • EPA # FL094 • FDER # EL020

APPENDIX D

Summary of Chemical Analyses of Water

SUMMARY OF WATER-QUALITY ANALYSES FROM WATER SUPPLY WELLS
NAS WHITING FIELD, MILTON, FLORIDA

Date	Analytical Method(s)	Compounds and Concentrations Detected in ug/l (micrograms per liter)	Analytical Laboratory
		SOUTH SUPPLY WELL (W-S2)	
11/1/85	EPA 608, 624, 625 Metals	4 ug/l trichloroethene	Pioneer
4/21/86	EPA 608, 624, 625	2 ug/l benzene	Pioneer
3/21/86	EPA 608, 624, 625	4 ug/l benzene	Pioneer
10/1/86	EPA 624	14 ug/l benzene	Pioneer.
10/1/86*	EPA 624	6 ug/l benzene	Pioneer
10/1/86	EPA 624	17 ug/l benzene	Compu Chem
10/1/86*	EPA 624	7.4 ug/l benzene	Compu Chem
		NORTH SUPPLY WELL (W-N4)	
10/1/86	EPA 624	None Detected	Pioneer
		WEST SUPPLY WELL (W-W3)	
10/1/86	EPA 624	11 ug/l trichloroethene	Pioneer
10/1/86*	EPA 624	6 ug/l trichloroethene	Pioneer

EPA Method 608, Pesticides/PCBs, gas chromatography
EPA Method 624, Volatile Organic Compounds, gas chromatography, mass spectrometry.
EPA Method 625, Semi-volatile organics - Base/Neutral and Acid Extractables, gas chromatography, mass spectrometry.

Pioneer - Pioneer Laboratory, Inc., Pensacola, Florida
Compu Chem - Mead Compu Chem, research Triangle Park, North Carolina

* Denotes sample collectd after treatment system; all other samples were collected directly from well.

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